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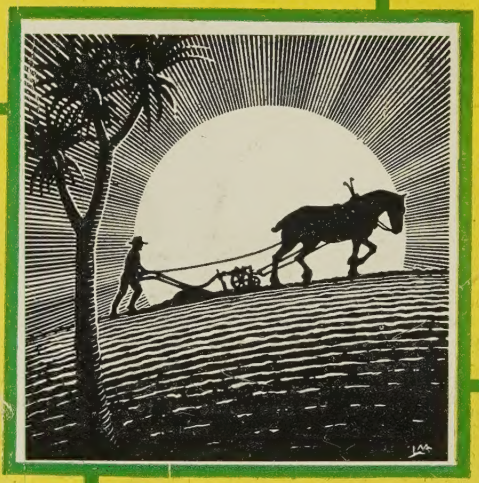

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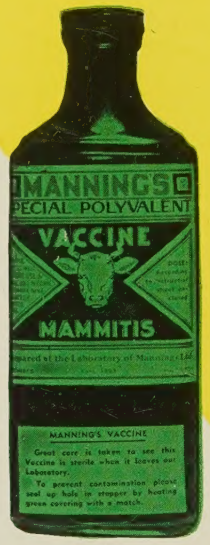

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Diseases in the Pig

Conditions Affecting Arthritis, Paralysis And Trembles

D. MARSHALL, District Superintendent, Livestock Division, Wellington.

ARTHRITIS

ARTHRITIS is inflammation of a joint. This disease is of considerable practical importance in the swine industry. At the meat works the percentage of pigs rejected for this cause varies from ½ to 1 per cent. in different works. In the field, however, it is responsible for considerable mortality in young pigs, and some unthriftiness.

Causes

There are various causes, and more than one factor may be concerned in any particular case. They may be grouped under the headings of infection, mineral deficiency (or imbalance,) injury, and poisoning.

Infection

In New Zealand infection is undoubtedly the most common and most important direct cause. Germs of various types may be found present, commonly streptococci of some kind. In countries where swine erysipelas is common this organism is a frequent cause. Rarely, the bacillus of tuberculosis may localise in or about a joint and set up a tuberculous arthritis. Skin ulcers in the vicinity of a joint frequently invade the joint cavity.

Although these notes do not break new ground, it is considered that it may be of benefit to review some points concerning three diseases in the pig, namely, arthritis, paralysis and trembles.

Defects in Diet

Defects in the mineral elements in the diet, or an improper proportion of these elements, may also be a cause.

In the United States, where grains, particularly maize, form a large percentage of the diet, there is likely to be an excess of phosphorus in proportion to the lime present. Under such conditions there may occur a type of stiffness and lameness, with some enlargement of the ends of long bones, at the joints. The condition may be put down to rheumatism. Under the reverse condition, with excess lime in proportion to the phosphates fed, similar conditions may occur.

It is very doubtful whether this type of arthritis is at all common in New Zealand, largely because milk forms a big portion of the feed for most pigs.

Certainly, in addition to the correct supply of minerals, there is necessary either a sufficient supply of vitamin D in the feed or adequate exposure to sunlight for proper bone formation. The above condition has been noted once or twice in pigs wholly confined to houses for long periods. With regular or periodic exposure to sunlight, and a mixed diet, including milk and grazing, the complaint is most unlikely.

Injury

Instances have occurred of an undue number of arthritis cases among pigs

which were known to have run over defective floors and gratings, with the opportunity for the foot or leg to slip through and the limb to be bruised or wrenched. Other cases are caused where a considerable number of pigs, running together, attempt to scurry through narrow gateways to feeding places or in and out of houses. The remedies for such conditions are obvious—sound floors, wider gateways, and fewer pigs run together.

Zinc Poisoning

Zinc poisoning has already been dealt with in the "Journal" in July, 1936, by Messrs. Grimmett and McIntosh, who described the first authenticated cases, in April, 1937, by Messrs. Grimmett, McIntosh, Wall, and Hopkirk, who described experimental zinc poisoning in pigs, and in the August and November issues, 1939.

Briefly, zinc poisoning is likely to occur only where a considerable length of new galvanised piping is used to convey skim milk or butter milk. The acid of the souring milk dissolves the zinc from the inside of the pipe. Unthriftiness and deaths occur, and a fairly constant finding was a type of arthritis with sponginess of ends of bones and loosening of cartilage. Since the occurrence of the condition was confirmed, odd cases of lameness have been detected in pigs in new layouts. where new piping was in use, and the pigs have recovered where the use of the piping was discontinued.

Most Common Type

The type of arthritis most commonly met in New Zealand in the living animal comes under the first heading, and can be described as acute bacterial arthritis or polyarthritis. This condition may be seen in small pigs from ten days to a month old.

Arthritis of this kind in the young animal is seen in other species—in foals under the name of joint-ill or navel-ill, in calves, and in lambs—and there is still difference of opinion as to the method of infection, whether through the navel after birth or from the mother before birth, and also as to the influence of the proper feeding of the dam. While the majority of cases occur in insanitary conditions, pigs may be affected when kept in well-bedded houses.

Symptoms

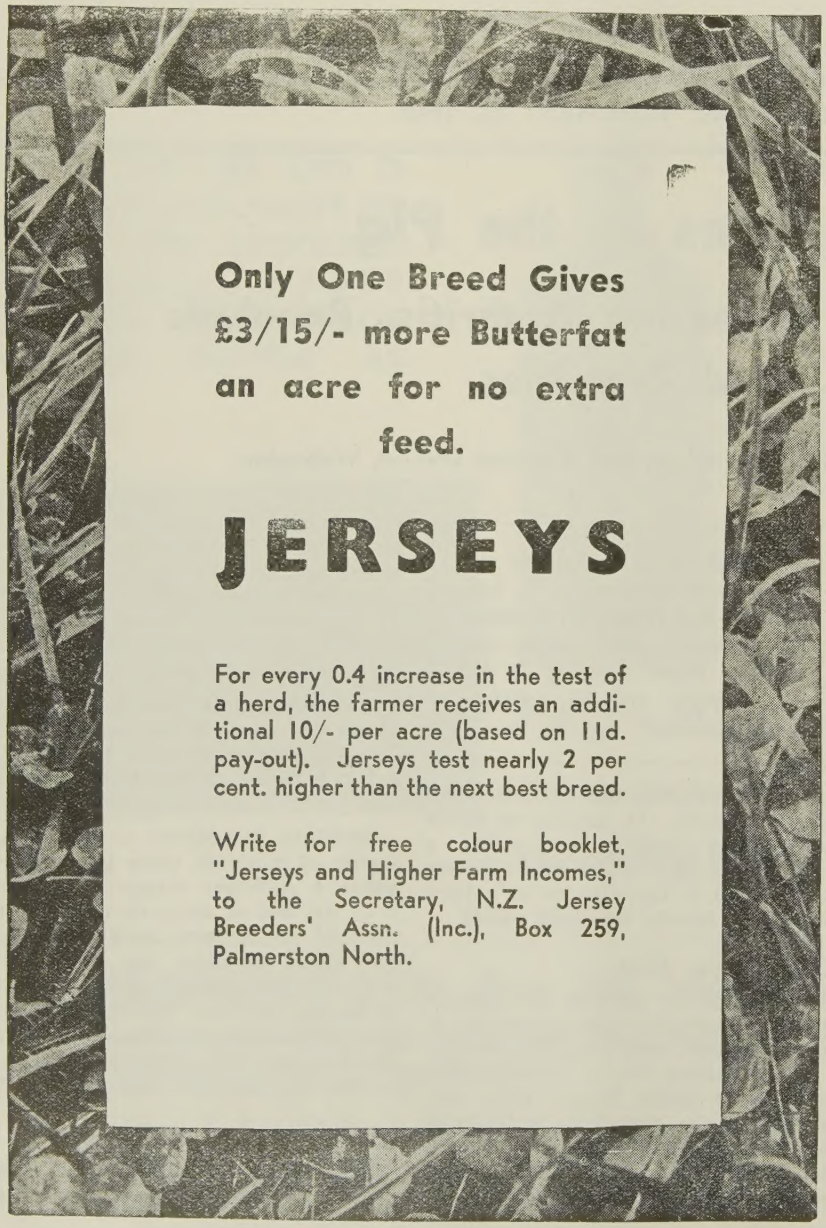
Lameness or stiffness may be noticed in the small pig. This is frequently put down at this stage to injury by the mother. Later, swelling occurs of one or more joints, hock, knee, stifle, in that order. The pigs lie about, are unwilling to move, and show pain on handling. Deaths occur from poisoning of the system. On being opened, the affected joints may be found distended with a turbid discoloured fluid instead of the normal clear synovia.

Treatment

Beyond keeping the little pigs warm and comfortable little in the way of treatment can be applied, and it is doubtful whether any treatment is justified except in mild cases. Mr. C. E. Ballenger, Experimentalist at Ruakura, has had instances of pigs which apparently recovered from an attack in the sucker period only to be rejected for arthritis at bacon weight, indicating that damage to the joint persisted.

Prevention

Prevention becomes of chief importance. Strict cleanliness of everything about the farrowing pen is essential, and small pigs should be kept from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roaming into dirty cowsheds, drains, manure piles, etc. Where a succession of cases occurs in permanent farrowing houses, they should not be used for a time, and sows should be farrowed in fresh quarters. This has sometimes resulted in cessation of the cases.

Correct diet, including sufficient protein, such as meat-meal, green-feed-grazing, and some mineral supply, should be supplied to the sow during pregnancy. The addition of iodine to the sow's feed has been tried, but little influence on arthritis was noticed.

PARALYSIS

Paralysis denotes inability, complete or partial, to use certain muscles because of interference with the nerve supply. In the conditions referred to here the muscles concerned are chiefly those of the limbs, more particularly the hind-quarters, though to some extent all muscles are involved. There is imperfect control of the hind legs, resulting in a staggery gait, or perhaps in the hind legs being trailed on the ground.

Paralysis is seen in fracture of spine, in tuberculosis of spine, and in vitamin A deficiency.

Fracture of the spine occurs mostly in mature pigs, such as sows, as a result of fighting or accidents. Sows which have just weaned a litter appear to be more liable to fracture because of the removal of portion of the mineral matters from the bones during pregnancy and lactation.

The resulting paralysis appears suddenly. The animal appears perfectly healthy, but is unable to raise its hind-quarters from the ground. Treatment is not justified. A waiting policy may be adopted for a day or two, but if the diagnosis of fracture is reasonably certain the animal should be slaughtered.

Tuberculosis

Tuberculosis of the spine is a rare cause of paralysis, but cases have been seen, again usually in mature pigs. The onset of the paralysis is more gradual. Diagnosis of the actual cause cannot be made with certainty during life, but a positive reaction to the tuberculin test would provide some confirmation.

Paralysis from vitamin A deficiency is the most common type. In Australia a very comprehensive report on the conditions was given by Seddon and Frazer in 1927, although the cause was not then known. More recent work in the U.S.A. and at Cambridge has shown conclusively that deficiency of vitamin A is a cause.

It has been noted more or less regularly in New Zealand. Here we meet it under conditions of feeding where this deficiency is very likely to occur, namely a skim milk diet without any supplement or green feed or grazing of any kind. It is probably a tribute to the improvement in the type of feeding and to the wider adoption of a sound open-air system with regular access to a good quality grazing that cases of this kind are becoming fewer.

Symptoms Seen

Affected pigs may be from three to six months old. Frequently they are in good condition. The first sign is unsteadiness on the hind-quarters and a tendency to sag to one side and for the pig to tumble over if it turns quickly. Later, the power of the hind legs is lost to such an extent that the animal is unable to stand on them and adopts a sitting attitude or trails the hind limbs. The voice becomes shriller, and the pigs are somewhat more nervous. A post-mortem examination may show nothing amiss, although the large (sciatic) nerves supplying the hind limbs may be found microscopically to be degenerated.

Treatment consists in supplying vitaman A, which can be done readily by giving fresh green feed, cod-liver oil, or whole milk. Where nerve damage is extensive, recovery does not always follow.

Prevention is along the same lines.

TREMBLES

This very apt name is given to a condition perhaps more properly termed chorea, or shivering, which is fairly frequently seen in small pigs. The whole body is constantly agitated by a jerking and twitching of the muscles, which may be so severe as to prevent the animal from standing up. One or two pigs, or perhaps the whole litter, may be affected in varying degrees.

Various writers have discussed this condition, and speculated as to its cause, and while there is a tendency to ascribe it to some hereditary factor, this is by no means established. In the writer's experience there was in one case a suggestion of an hereditary factor, all the sows farrowing to one boar showing a percentage of cases in their litters, while litters by another boar and farrowing about ths same time were unaffected. In other cases, however, sows which had affected litters were again bred to the same boar and had normal litters. A sow affected as a sucker was bred, and litters were not affected.

More Data Needed

Further information over numbers of cases is required before any preventive measures can be advised.

Where affected piglets are able to suckle, they should be kept, as the tendency in all cases is to gradual disappearance of the condition. Usually, all signs of it are lost by weaning time. Occasionally, little pigs are so badly affected at birth that they are unable to suck or even to stand up.

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Two adjoining properties in Poverty Bay, showing manuka extending to the boundary fence. The foreground was ploughed, cropped and regrassed. Note the ingress of rushes in place of manuka because of increased fertility.

Farmers' Fight Against Scrub

Methods of Controlling Manuka, Tauhinu, Bracken Fern and Hard Fern

E. M. BATES, Instructor in Agriculture, Gisborne.

MANUKA, tauhinu, bracken fern and hard fern are some of Nature's earlier volunteer plant forms in the natural succession of plant species back to natural forests from the artificial pastures placed there by man.

There are in the Dominion several million acres in scrub of one form or another, much of which has reverted from sown pastures. Huge sums of money are spent annually in a continual and often vain struggle to keep such growth in check.

On unploughable hill country the difficulties are many, and mistakes, once made, are not readily rectified. In any effort at control it is essential to have a knowledge of the growth-forms and life-histories of the plants and their relation to local conditions if the most effective measure of control is to be obtained.

The weeds under review usually make their first appearance in the young bush-burn pastures two or three years after the primary burns. They may rapidly take charge, until eventually they are replaced by taller-growing plants if Nature is allowed to take its course unchecked.

Manuka, tahinu, bracken fern and hard fern have been responsible for the expenditure of large sums of money in a continual and often vain struggle to keep such growth in check. Effective methods of controlling such scrub are described, but in any effort of control it is essential to have a knowledge of the growth-forms and life-histories of the plants.

Manuka

RED OR STUNTED MANUKA.
(Leptospernum scoparium.)

On much of the surface-sown, deteriorated grasslands, inadequate pasture cover, together with the ineffectual trampling of stock due to low-carrying capacity, cannot check manuka aggression.

In the Poverty Bay district manuka is kept well in hand on most of the hill country, but it is fairly prevalent along the southern boundary of the Cook County and Wairoa. Odd patches occur on the East Coast and parts of the Matakaoa County. The higher country frequently has a top layer of pumice.

A small proportion is ploughable and is then easily brought in with swedes, followed by rape, before sowing down. One good ploughing will destroy the manuka if the seed is buried properly. The ground is not turned over again, and only surface cultivation is carried out.

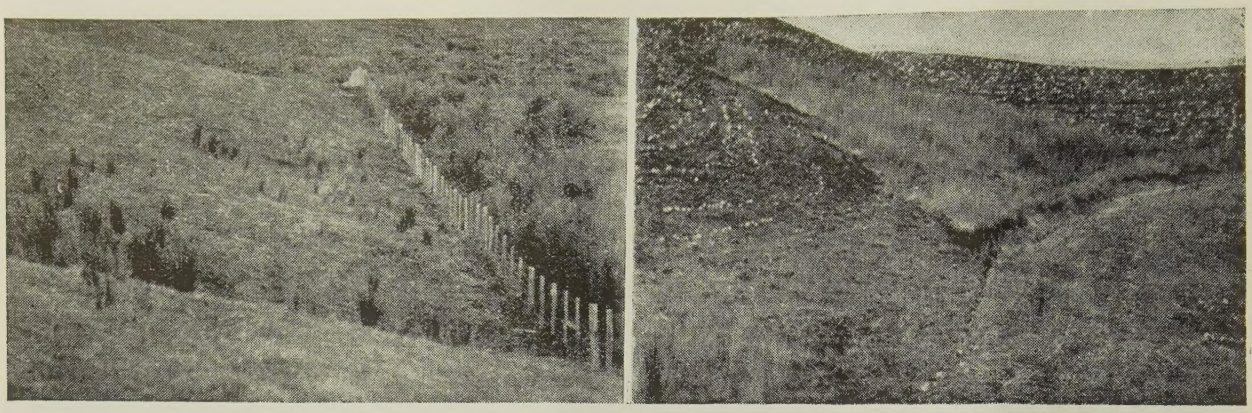
Stock droppings from the fed-off crops enrich the surface soil for the grass sowing. In the Waerenga-o-kuri district there is an excellent example of the conversion of ploughable, stunted-manuka country to high-class pastures of ryegrass and subterranean and white clovers.

Afforestation

Control is often very difficult and uneconomic because of high maintenance costs per acre in the incessant struggle against this persistent weed. On steep and difficult country with a low productive limit, where it is almost impossible to keep manuka in check, reafforestation appears the only reasonable solution.

Control Factors

Manuka is a particularly free seeder. The seed is shed during August to germinate in September. A proportion



Left.—Looking along the boundary fence between the properties in Fig. 1. *Right.*—Cropping stunted manuka country with swedes, followed by rape, before grassing.

of the seed heads retain the seed longer, and this will not germinate until the following spring at least.

Fortunately, if manuka is cut below the lowest branches so that no leaves are left on the stump, further growth of the individual plant is stopped. Mature, standing manuka should never be burnt, as the green seed heads are ripened by the fire and reinfest the bare ground after the burn.

Control Measures on Unploughable Country

Control measures must aim at destroying the plant in the seedling stage and preventing reseeding. With unploughable country, the essence of control is to cut, burn, sow, pull up young growth, and utilise stock for crushing. Cutting usually takes place from the beginning of Steptember to March. With early cutting there may be much green growth of thistles, grass, etc., to spoil the burn, and manuka seedlings will also be coming up. Early cutting may be satisfactory where there is little of this growth due to poor ground or dry conditions.

Even with late cutting, green growth may spoil a burn or result in a poor burn in wet seasons, especially with light manuka. In such cases, much seed, seedlings, and small manuka overlooked by the scrub cutter will not be killed. Late cutting is much safer, but at this time labour is often a problem because of seasonal work. This is one reason why some cutting is carried out in winter and spring, which is not the best time.

Where convenient, the lee sides of hills which are away from drying winds might be cut first, as this results in more even drying. Burning should not take place until the manuka has dried out well, without, however, too great a loss of leaves. Good conditions for a burn are absolutely necessary and the best possible burn should always be obtained.

In some places it is a practice to burn at any suitable time with the object of destroying the manuka and increasing the danthonia. This is a cheap method of destroying manuka and certainly has the desired effects, but continuous burning does not improve soil conditions, and a solid danthonia sward is likely to result.

Sowing and Management

Spring sowings are not usually successful, and autumn burning and sowing are safer. Sowing should follow immediately after the burn and should be as early in the autumn as possible, in order to give the pasture species every chance against volunteer weed growth, or before leeching of the ash from the burn occurs. Every effort should be made to obtain good pasture establishments, which is an important factor in control, as the closer the sward the poorer the establishment of manuka from seed.

January may be the best month for burning and sowing grass seed in the lighter hill country of the higher levels. There is then a reasonable chance of rain in February and of the plants becoming well rooted before cold weather sets in. Plants have two good months to become established, and grow fast at this seasonable time.

The fencing of sown areas is essential. If a fair pasture sward is obtained cattle will eat the young manuka with the grass. The trouble on manuka burns is to obtain a thick sole of grass. If possible, it is most desirable to topdress with available phosphate to assist establishment of pasture species. It is contended that this is the important time for applying fertiliser.

Fertilisers

Fertiliser has the effect of stimulating growth and giving a better pasture cover. This, in turn, increases the carrying capacity, with the ability to crush sown areas more adequately during the early years. Periodical crushing during this period is essential to success until the sward, mainly danthonia, becomes stabilised.

After two or three years it is frequently necessary to grub and pull young manuka. This first pulling may cost 10s an acre on fairly bad manuka country. Usually, it is necessary to repeat the pulling and grubbing process every second or third year, but at a diminishing cost each year.

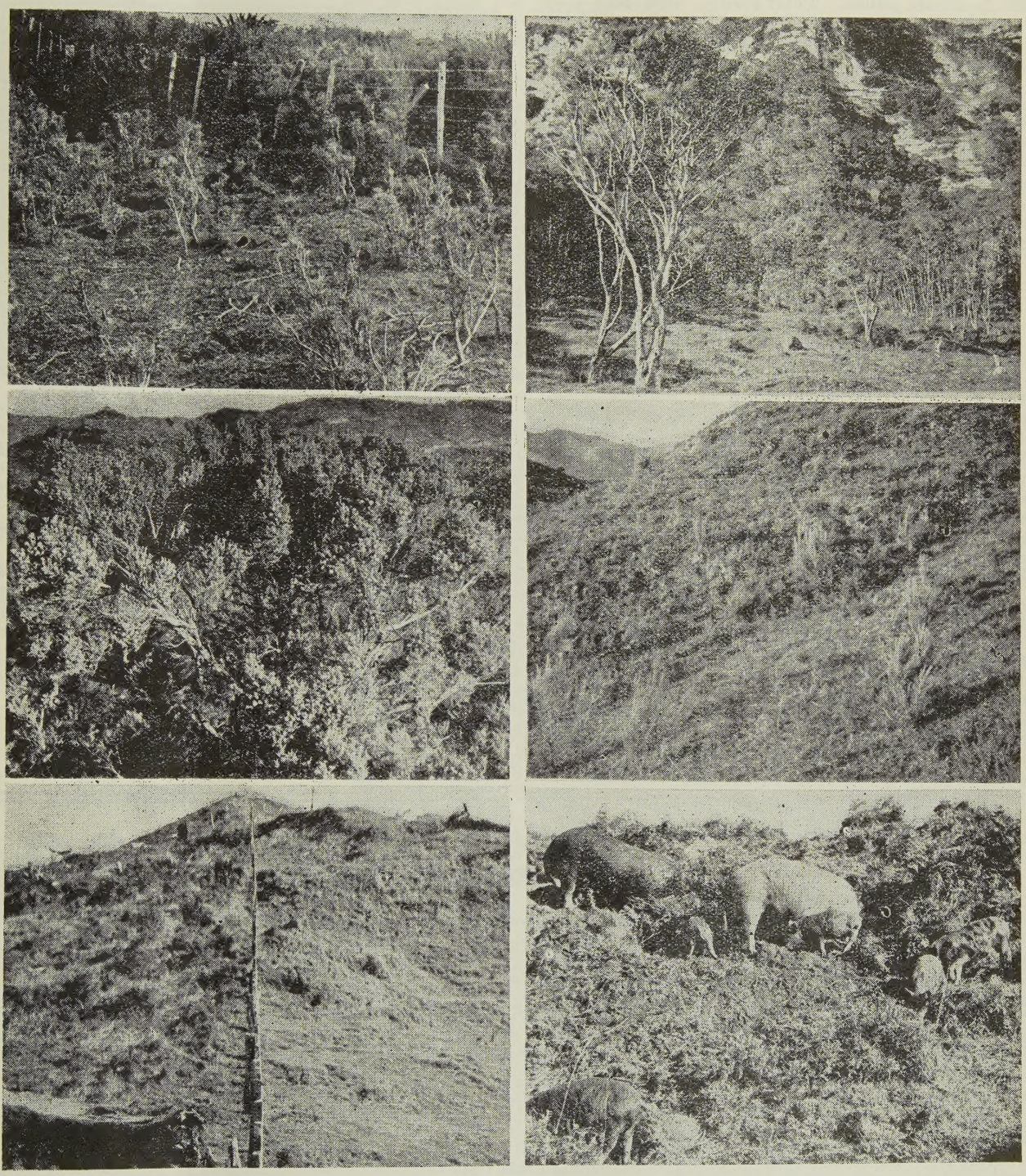
Definite advantages of this practice over periodical burning and sowing every six or seven years are that there is no loss in grazing and no damage to wool, while there is the possibility of eradicating the manuka in time. Pulling and grubbing should be carried out when the manuka is small and scattered. Much of this work can conveniently be done in the early winter.

The heavy white or tree manuka (*Leptospernum ericoides*) is treated as bush and cut in the winter.

Tauhinu

(*Cassinia leptophylla.*)

Tauhinu is a native scrub with heavier foliage than manuka, and is common on the East Coast hill country along the coast. It is frequently found alone or scattered in the manuka.



Top left.—Manuka will not stand continuous tramping. A comparison between two paddocks. *Top right.*—Tall (white) manuka at Te Araroa. This is treated like bush and cut in the winter. *Middle left.*—A large bush of tauhinu at Wharerata. *Middle right.*—Small scattered plants of tauhinu. *Bottom left.*—Bracken fern controlled in one paddock but not in the adjoining paddock. *Bottom right.*—Pigs rooting in bracken fern.

Young growth, if only a few inches high, is usually pulled. Taller growth should be cut like manuka, but it is liable to shoot again if cut in the winter before the sap rises.

Tauhinu burns well. It is safe to burn young growth, but when mature plants are burnt the seeds drop and germinate freely on the bare ground beneath, which restricts burning after cutting. The dense association common with manuka does not often occur with tauhinu, and the isolated plants are cut and the tops left to rot.

Bracken Fern

(Pteridium esculentum.)

In one form or another bracken has a world-wide distribution. It is common throughout the North Island of New Zealand, and is too frequently allowed to grow unchecked on roadsides and railways. In the Poverty Bay district the steeper, higher country was originally in bush, while the easier, more open country not in bush was largely in bracken fern. There was practically no native grass, as was the case in Hawke's Bay.

Control Factors

Bracken fern is propagated by means of spores, which are noticeable on the under-surface of the leaves in the winter. A single strong rhizome is developed underground, and from this, behind the growing point, a single tender shoot or frond, forming a leaf, is normally developed each year. The rhizome creeps forward below the ground at a depth of from 6in to 1ft, while the older portions gradually decay behind.

In the natural state fronds appear mainly in October-November, but under control measures such as burning, crushing, or cutting, the growing period is extended by the appearance of new fronds through to March, and in some seasons even a little later. On the developed leaf depends the vitality of the rhizome, and destruction of the fronds as they appear results ultimately in control. From about March to October bracken is dormant.

Control

When the young fronds are in the curl stage they are readily eaten by stock, especially by sheep, and being tender break off. These fronds do not grow again, but a fresh frond is forced up from a bud which normally would develop the following year. Obvious control measures are crushing with both cattle and sheep over the period when the young fronds are appearing through the ground. Cattle are more important as the fern hardens.

In a very short time a frond develops into a leaf. After the stems toughen tramping is less effective, and stock do not eat the growth readily.

About March it is usual to ease up the stocking on fern country as much as possible. If the fern is allowed to mature in the summer it hardens, and stock will not eat it in the following winter.

It is not a good practice to burn fern in February and depend on the stock to eat the later growth in the winter. The burning is bad, and the season may be unfavourable. The young fern may become too hard before being eaten if conditions are dry in March. From March to October, when the bracken is dormant, light stocking will allow grass growth to come away, facilitating further crushing in the following spring.

With a heavy growth of bracken fern it is possible to get a 99 per cent. burn in March, although this is also possible in September. In districts where the fronds appear strongly in February or early March it is wise to delay burning until the middle of March and to sow immediately the fire is out. Burning in spring is not recommended. If this occurs, crush perodically until autumn in order to control young growth coming through.

Sowing

Sow in early March while crushing is in progress unless frond development is still strong, in which case mid-March sowing is safer. Sowing will depend somewhat on the season and the district, but the aim should be to have the seed distributed to grow with the autumn rains. If there is much young fern coming up in the new pasture further crushing will have to be undertaken next spring.

An increase of cattle with a decrease in sheep gives more rapid control, which usually takes about three years. It may take more or less time to control the fern, depending on the seasons and the way in which the area is treated.

Although fern can be crushed out with cattle without burning, this is difficult to accomplish, and is hard on the cattle. The poorer the country, the harder it is to crush successfully. Stock will eat fern less readily on poorer country, where it is known as "sour growth." Crushing is not so difficult on better country, and stock eat the fern more readily.

At one time, purchasing stock in the spring and selling again in the autumn resulted in financial loss, which did not assist in the control of bracken fern. Today, this difficulty is not present, as the stock market is more stable throughout the year.

Pigs are useful in clearing up small paddocks of fern, as they root up the starchy rhizomes for food.

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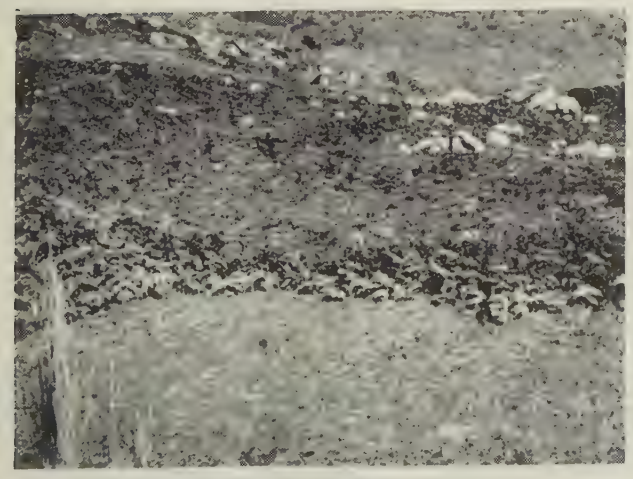
Top left.—A patch of hard fern.

Top right.—Hard fern on hill country at Wharerata.

Middle.—Surface rhizomes of hard fern after a burn.

Bottom left.—A ring which is frequently left after burning hard fern.

Bottom right.—Water fern at Matakaroa.



Ploughable Country With Bracken Fern

The cheapest and quickest method of establishing pasture on ploughable country, especially if one is prepared to topdress, is to burn in the autumn, disc, topdress, and sow as soon as possible. On virgin country it is usually necessary to effect establishment as early as possible, and expense is the deciding factor. Cropping with swedes and rape before sowing down will result in strong pastures, but this involves considerable expense, and can be carried out only by the more financial farmer.

Hard Fern

(*Paesia scaberula.*)

Hard fern (*Paesia scaberula*), also known as ring fern, carpet fern, or sweet fern, is a native volunteer weed widespread in New Zealand on poor hill country pastures with a rainfall in the vicinity of 70 inches or more. Plants establish in places not usually tramped by stock, such as on the steeper faces or in the shelter of logs, etc.

Control Factors

Hard fern grows from spores, and the plants spread by means of surface rhizomes, which re-root outwards. From these the leaves grow to a height of about 18in, and the plants form more or less circular patches completely covering the ground.

If moisture is low the fern may have a hard time, but in a wet season the patches may increase about 1ft in diameter. After burning, the fern increases in size from the rings more rapidly than on the unburnt patches. Close grazing by sheep favours the re-rooting of the rhizomes on the barer pasture, as in the case with piri-piri (bidi-bidi).

Control

Bracken fern forms strong, underground rhizomes, but on the other hand, hard fern forms numerous wiry, surface rhizomes. On this account control is largely different. Actually, effective burning is the only practical means of control with hard fern, while crushing with stock is the main line of attack against bracken fern.

It is most unwise to burn in the spring, although after the winter the hard fern has much dead growth throughout and burns well. After spring burning, the fern comes away rapidly as young green growth, and appears to be invigorated, or at least renewed, at this time. The surface rhizomes are succulent and difficult to kill. Young fern may also appear on the ground after spring burning, as there is usually sufficient moisture at this time for the spores to germinate.

Time for Burning

The best time for burning is in the late summer, autumn, or, on high country, between mid-summer and early autumn. Burning should be carried out, however, only when the rhizomes, as well as the ground, are well dried out. If conditions are such that a really hot fire can be obtained the fern may be killed outright, but at least there will be no growth until the following spring.

If the season is not dry enough, burning is better left until a more favourable season, even if a year or two may elapse. In any case, burning should be delayed for two or three years' growth, which is sufficient to make it possible to have a good fire to destroy the fern, and to allow for a good amount of ash to start the grass seed. Sow immediately on the burn.

Superphosphate greatly assists the young grass and clover, inducing a denser pasture cover and stronger growth. Stock will then frequent the newly-sown patches more, and their tramping causes further injury to any remnants of the fern.

There is no hard and fast rule for burning. Whether the operator starts at the top or the bottom will depend on wind and smoke, the density of the patches, and the steepness of the country. The ordinary blow-lamp is very satisfactory for lighting fires.

It may be difficult to keep out hard fern when the sward is weak, and the land has not been logged, for the ground is usually heavily infested with spores. It is difficult to deal effectively with young plants and rings where patches have not been completely burnt out.

Spraying Trials

Interesting spraying trials with arsenic pentoxide were carried out several years ago at Whangamomona. A mixture of 1lb to 32 gallons of water proved the most effective strength. A stronger solution killed the tops without sufficient damage to the plants, while weaker solutions were also ineffective. Spraying round the edges of patches and on isolated plants which are not strong enough to burn might be carried out in January during fine weather several weeks before firing to obtain a cleaner burn.

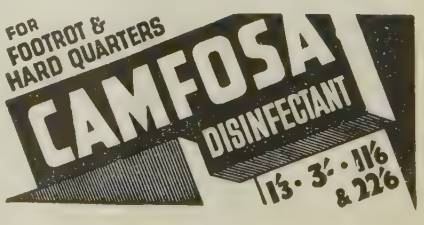
If cattle make a bed on hard fern the centre dies out, but growth continues outwards from the edges of the rings. Stock would injure the fern by tramping, but they seldom frequent hard fern patches. Crushing is effective with bracken fern, but not with hard fern, and, actually, control of bracken fern in some localities paves the way for hard fern.

Tramping may be effective with hard fern on very small areas, but it is as well to make the distinction between crushing and tramping. Crushing involves tramping and eating, and stock never eat hard fern.

Pasture Species in Hill Country Sowings

Suckling clover, white clover, and subterranean clover usually establish much better under topdressing. In the secondary bush burn mixtures dogstail is always worth inclusion. Ryegrass affords quick cover and early feed, although its life may be short under hard conditions. A small proportion of Italian ryegrass also gives quick feed in the first year. Browntop is naturally suited to higher, damper country, and establishes well, but it is not suited to dry hill country, which runs to danthonia eventually.

Danthonia is difficult to establish from sowings, but comes in as a volunteer with the opening up of the sward as other species die out. Cocksfoot is also difficult to establish, particularly under grazing after a secondary burn. A small quantity of yarrow is frequently included on poor hills. *Lotus major* is slow, but has proved useful under wet conditions. Paspalum is worth inclusion in warmer districts, and although slow to take hold, it is a valuable pasture constituent in the dry summer months.



Milk and Cream Grading

Contributed by the DAIRY DIVISION.

THE object of grading milk and cream is twofold. It serves to keep the supplier advised regarding the quality of his produce, thereby giving him an opportunity to correct any defect, and provides the means of inflicting the penalty without which any regulation is impotent.

The deduction from the butterfat payment for second-grade milk and cream cannot be regarded as an indication of the difference in value between those two qualities. For instance, the inclusion of 20lb of garlic-flavoured cream in a churning of 20 boxes of butter has been known to reduce the quality to second-grade, which, on the differential of ½d per lb allowed at that time, amounted to 46s 8d. The deduction of the 8lb of butterfat which the cream contained amounted to only 8d.

The loss in this instance was easily calculated, but there are many cases in which the secondary qualities are mixed with the higher-grade cream, and although the butter made may not be poor enough for second-grade, there is a general reduction in quality which is not compensated by the small amount deducted from the second-grade butterfat. There may be, in addition, an inherent unsoundness in the butter which is not noticeable at grading, and as an instance of this we have the experience in connection with the manufacture of unsalted butter, for which purpose only cream of the highest quality can be used.

Milk for cheese-making is, generally speaking, not graded until after the manufacturing process is well advanced, so that segregation in this case is not possible.

Start of Grading

Cream grading was undertaken by individual dairy companies on a voluntary basis in the first instance, and the experience so gained led to the demand from the industry for both milk and cream grading. Cream grading was made compulsory in 1926, but milk grading was not started until 1931.

In both instances the grader is required to hold a certificate which is issued by the Director of the Dairy Division after the applicant has been examined and passed as competent by an instructor. This certificate may be cancelled if for any reason the Director is of the opinion that the grader is no longer a fit and proper person to be entrusted with this responsible work.

In the case of milk for cheese-making, two grades (first and second) are compulsory and finest grade is optional, but milk for butter-making must be graded into finest, first, and second grades.

The standard of grading for milk for cheese-making is that, if manufactured separately without pasteurisation, it would make cheese of the quality assigned to it.

The standard for milk and cream for butter-making is that, if manufactured separately by the usual approved methods, it would make butter of the quality assigned to it.

Method of Grading

The method of grading varies according to the use which is to be made of the milk. Thus, milk for cheese-making must be based jointly on the curd test, and either the reductase or the microscopic tests. Milk for butter-making, which includes milk supplied to a casein station, a dried milk or a condensing factory, must be graded by (a) the curd test, or (b) the reductase test combined with the senses test; (c) the microscopic test together with the senses test; (d) the curd test together with the reductase or the microscopic test.

It will be noted that the provisions are wide enough to cover all the methods which have been used from time to time, but in actual practice it can be accepted that milk for cheese-making is graded by the curd test plus the reductase test, while milk for butter-making is graded by the reductase test plus the senses test. The senses test in this case means that milk which has not decolourised in the time fixed for finest or first-grade may, after those periods have elapsed, be graded down to first or even second-grade by the sense of smell.

There is a further provision that milk which is second-grade by the sense of smell or taste—sour or turnipy milk, for instance—or milk which is shown to be dirty by the sediment test, which is a test for actual dirt, may be put

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into that class without the application of any further test.

In general, the grading of cream is carried out solely by the senses of taste and smell, although the grader is quite within his rights in degrading cream which contains visible dirt, or is churned, ropey, curdy, etc. Cream must be graded within three hours of being received at the creamery into finest, first, or second-grade, and if so desired the grade of either milk or cream may be indicated by points.

Right of Refusal

Under certain conditions the manager has the right to refuse to accept delivery of either milk or cream, and is, in fact, required to do so if, for instance, it is affected by putrefactive decomposition, contains or has contained any bird, etc., is affected with the flavour of any disinfectant, kerosene, etc., or contains anything which renders it unfit for the manufacture of a product for human consumption. In all these cases he shall forthwith add to such milk or cream a sufficient quantity of methyl violet to colour effectively the whole of it.

He may also refuse to accept milk or cream which he considers to be below second-grade and also milk or cream which, if mixed with the rest of the supply, would reduce the quality of the whole of the produce made from it, but in this case he can use his discretion regarding the addition of colouring matter.

The responsibility for the correct grading of milk and cream rests in the first instance on the grader, who must, in the case of milk, indicate the grade on the sheet or docket on which the delivery is recorded. In the case of cream, he must enter the grade on a docket, which shall be initialled or marked and be delivered or sent to the supplier after each delivery. This responsibility is shared by the manager who, with the grader, is responsible to the cheese or butter instructor in charge of the district. This instructor, with the Special Dairy Inspector, exercises such supervision over the work as may be necessary to maintain a correct standard of grading.

Standard of Grading

From the foregoing it will be noted that the standard of grading must be based on the quality of the product which can be made from the milk and cream received. This being so, the grader cannot take into account the disabilities of the supplier in regard to distance from the factory, inferior pastures, and so on, but must confine himself to the quality from a manufacturing point of view. In practice, the standard is actually set by the class of milk or cream delivered by the best suppliers.

Grading without a penalty would have little effect, and the deductions provided are designed to keep an even balance between milk for cheese-making and milk and cream for butter-making. In all cases they are the minimum differentials which must be made.

Thus, the deduction from butterfat for milk graded second-grade for either butter- or cheese-making must be at least ½d per pound, while the deduction from butterfat for cream graded second-grade must be at least 1d per lb. This apparent discrepancy is due to the fact that cream from milk which would make second-grade cheese will frequently make first-grade butter, and if 1d deduction were made from milk it would be an inducement to a careless supplier to supply cream.

The extra payment for finest-grade butterfat is optional in the case of milk for cheese-making, but must be at least ½d per lb of butterfat for butter-making. All deductions and additions must be made on the first payment, and all subsequent payments must be evenly distributed over all grades of butterfat.

Suggestions which will assist in the production of high-quality cream, most of which apply equally to milk, will be found in Bulletin No. 139, which will be posted by the Department of Agriculture, Wellington, on application.

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NOT GUILTY

CERTIFIED RYEGRASS BEFORE COURT

HELD TO BE SUPERIOR

UNCERTIFIED STRAINS CRITICISED

(From our Special Correspondent, D. R. Wilkie.)

BLENHEIM, January 13.

After a trial lasting more than three years, Certified Ryegrass was acquitted by His Honour Mr. Justice Topdress in the Court of Agriculture at Blenheim recently on a charge of fraud. Certified Ryegrass pleaded not guilty.

It was alleged that Certified Ryegrass had falsely claimed that it was superior to Uncertified Ryegrass, but in his judgment his Honour said that on the facts laid before the Court it was definitely established that the charge was false, and that Certified Ryegrass had been completely vindicated. His Honour levelled severe criticism at the claims advanced by Uncertified Ryegrass, and stated that he had no hesitation in pronouncing the sentence that, contrary to the charge laid, Certified Ryegrass was definitely superior to Uncertified Ryegrass.

"Once again Certified Ryegrass has shown itself to be well worthy of the many favourable comments bestowed upon it," said his Honour, in giving his judgment. "On the facts before the Court the obvious conclusion to be drawn is that, where permanent, high-producing pastures are required, Certified Strains of ryegrass and clover should be used exclusively."

ALLEGED FAULTS.

Opening the case, Counsel for Uncertified Ryegrass said it was claimed that Certified Ryegrass was unjustified because (1) it cost more to establish in view of the higher price of the seed, and (2) it had a poorer production value because of its lower palatability in comparison with the cheaper established and more rapidly grown line.

Counsel for Certified Ryegrass: Can you prove those points?

Counsel for Uncertified Ryegrass: It is the general opinion.

Counsel for Certified Ryegrass: Opinions are not proof.

Continuing, Counsel for Uncertified Ryegrass said that his claim for cheaper cost of establishment must be generally admitted after a study of relative prices of seed, while under local conditions of relatively low rainfall the improvement in palatability through the use of fertilisers followed by good grazing management could not be obtained.

Counsel for Certified Ryegrass: May I ask my learned friend whether these swards can be economically maintained?

Counsel for Uncertified Ryegrass: Admittedly, these swards cannot be economically maintained even if desired.

Counsel for Certified Ryegrass: A point in favour of Certified Ryegrass, which has proved itself to be truly permanent.

RESULT OF EXPERIMENT.

Opening his case Counsel for Certified Ryegrass said an experiment just completed in Marlborough had demonstrated effectively the superiority of Certified Ryegrass over Uncertified Ryegrass. Its greater carrying capacity, excellent recovery after grazing, and its superior persistence were all clearly shown, while further light was shed on the much-debated question of its palatability.

Counsel for Uncertified Ryegrass: Your Honour, I submit that that is a question for the Court, and is not for my learned friend to say.

Counsel for Certified Ryegrass: I have evidence which I will place before the Court at a later stage.

His Honour: I think it would be as well if Counsel confined himself to facts at this stage.

Counsel for Certified Ryegrass: I bow to your Honour's ruling.

Continuing, Counsel for Certified Ryegrass said an experiment was carried out on the farm of Mr. E. Smith, Tuamarina, and took the form of a grazing trial on two similar paddocks with identical treatment except that one paddock was sown with Certified Ryegrass while the other was sown with ordinary ryegrass below certification standard.

A nine-acre paddock was selected and prepared for sowing down to grass, all parts of the paddock having the same preliminary cultivation. A dividing fence was then erected, and in April, 1936, the paddocks were sown. A bushel and a half of ryegrass with 3 lb. of Certified White Clover was used in each case, and one bag of superphosphate per acre went on with the seed. Paddock "A" had, as mentioned earlier, Certified Ryegrass, while in Paddock "B" Uncertified Ryegrass was used. In all other respects the sowing down and manuring of the paddocks were identical.

Counsel went on to say that both paddocks struck well and made good growth in the spring, at which time half a ton of lime was applied to the whole experiment. Because of adverse weather experienced in the first few months, establishment was rather slow, but by October a fair sward was evident.

FIRST WITNESS.

Counsel for Certified Ryegrass then said he proposed to call evidence on the superior recovery after grazing of the certified strains.

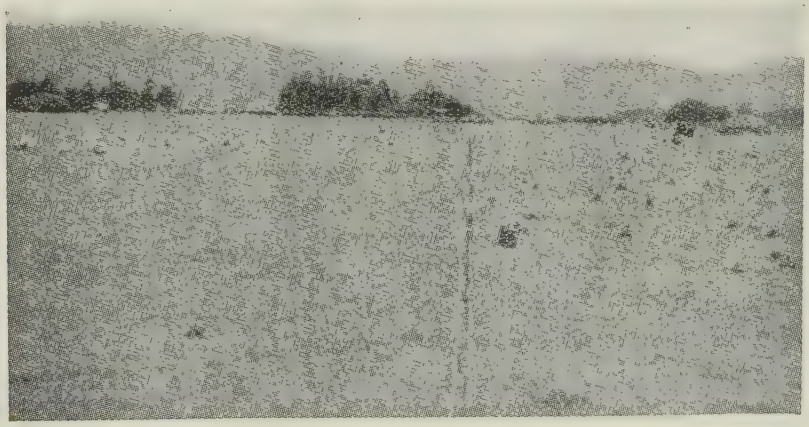

Exhibit A.—Certified Ryegrass on the left, Uncertified Ryegrass on the right.

In the witness box, Mrs. Ewe Hogget said that even by October the superior recovery after grazing of the certified strains was most noticeable.

"The flock, of which I was a member, kept the paddocks well grazed," she said. "Our employer kept monthly records of the stock carried on both sections."

Counsel for Certified Ryegrass: Did Uncertified Ryegrass attempt to run to seed about November?

Mrs. Ewe Hogget: Yes. We simply could not stop it.

Counsel for Certified Ryegrass: Did Certified Ryegrass also attempt to run to seed at that time?

Mrs. Ewe Hogget: Yes. But not nearly to the same extent.

DIFFERENCES APPARENT.

Continuing, witness said that in December both paddocks were topped by mowing. The differences in ryegrass were now becoming very apparent. The Uncertified Ryegrass showed a stemmy, open character, while Certified Ryegrass was more "bushy" and filled out the sward more satisfactorily.

Counsel for Certified Ryegrass: When did Field "B" begin to show the first definite signs of deterioration?

Mrs. Ewe Hogget: In February, 1937—almost a year after sowing.

Counsel for Certified Ryegrass: Will you kindly describe these signs to the Court?

Mrs. Ewe Hogget: Spaces became apparent in the sward, and they were soon filled either by clover or weeds.

Counsel for Certified Ryegrass: Did the weed invasion continue?

Mrs. Ewe Hogget: Yes, definitely. We all noticed that from this time onward the Certified Ryegrass paddock asserted its superiority both in its appearance and in the number of my friends it was able to carry.

Counsel for Certified Ryegrass: How did the two paddocks compare during the next year?

Mrs. Ewe Hogget: Paddock "A" became better just as quickly as Paddock "B"—the Uncertified Ryegrass—deteriorated.

His Honour, Mr. Justice Topdress: Was any analysis made of these two paddocks?

Mrs. Ewe Hogget: Yes. Towards the end of 1937 a representative analysis of Paddock "B" showed that it contained white clover, hairgrass, mouse-eared chickweed, sorrel, Scotch thistle, and odd tufts of ryegrass—not a very palatable meal, I can assure your Honour.

BETTER RESISTANCE.

"We also noticed the better resistance shown by the Certified Ryegrass to the dry spells," said Mrs. Ewe Hogget. "At the peak of one of these spells Certified Ryegrass was still green and thriving, while Uncertified Ryegrass presented a uniformly 'burnt-off' appearance. You can imagine which paddock we patronised."

Counsel for Certified Ryegrass submitted that the evidence before the Court pointed to the superiority of Certified Ryegrass on the counts of persistency, recovery after grazing, and robustness, and also showed the futility of manuring poor strains with a view to obtaining permanence. Further, facts collected through the grazing records showed excellence in other directions.

Counsel for Certified Ryegrass then produced grazing records of the stock carired from October, 1937, until the conclusion of the experiment in November, 1938.

GRAZING RECORDS.

Counsel said the records showed that at the start both paddocks carried a similar number of stock, but that after a year or so the Uncertified Ryegrass block began to fall behind. In the last few months of the experiment Certified Ryegrass was carrying 100 per cent. more than Uncertified Ryegrass. The total figures for the two sections revealed that Certified Ryegrass and Certified Clover recorded 4300.3 sheep days per acre, while Uncertified Ryegrass and Certified Clover recorded 3040.0 sheep days per acre.

Recalled by Counsel for Certified Ryegrass, Mrs. Ewe Hogget said that this represented 41.1 per cent. more stock carried over a period of three years.

"We sheep thrived equally as well on Certified Ryegrass as on Uncertified Ryegrass," said Mrs. Ewe Hogget. "When the fence dividing the paddocks was taken down at the conclusion of the experiment we certainly did not prefer the poorer type. If anything, I think we concentrated more on the Certified Ryegrass block."

Counsel for Certified Ryegrass: Why was that?

Mrs. Ewe Hogget: Possibly because there was ample feed there, while the Uncertified Ryegrass had practically nothing to offer.

Counsel for Uncertified Ryegrass said he did not wish to cross-examine, and did not propose to call evidence on his client's behalf.

JUDGE'S COMMENT.

"The obvious conclusion to be drawn," said his Honour, in giving his judgment, "is that where permanent high-producing pastures are required Certified Strains of Ryegrass and Clover should be used exclusively."

Going Places?

Look at the variety of holiday locations New Zealand offers you. Rotorua, Waikaremoana, Waitomo, Chateau, The Glaciers, Mt. Cook, Queenstown, Milford. The best holiday you've ever had lies right ahead of you. Plan it now through the Government Tourist Bureau, utilizing their expert Travel Service, which arranges tours, books accommodation, and issues tickets for all means of transport.

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Pig Census Returns

Production of Pig-meat per Sow

M. J. SCOTT, Superintendent of the Pig Industry, Wellington.

THE pig census returns from approximately 280 farms for the year 1938-39, discussed in the last two issues of the "Journal" under the headings "Amounts of Meal Used" and "Proportion of Meat-meal Used," have again been examined, this time from the viewpoint of the amount of pig-meat produced per sow. The farms are grouped as follows:—

Those in which sows produce—

(A) Less than 800 lb. of pig-meat per sow (95 farms).

(B) 801 to 1200 lb. of pig-meat per sow (90 farms).

(C) More than 1200 lb. of pig-meat per sow (96 farms).

The results are in close agreement with those obtained from last year's returns, and are set out below.

Group.	A.	B.	C.
Number of farms	95	90	96
Averages of—			
Pounds of pig-meat per sow	517	977	1477
Number of cows per farm	36	52	55
Number of sows per farm	5.1	5.8	3.8
Number of cows per sow	7.0	10.4	14.0
Production per sow as:			
Number of pigs born	11.6	13.1	15.0
Number of pigs bought	0.5	0.9	2.7
Number of pigs sold	9.0	10.4	13.8
Number of pigs died	2.9	3.7	3.9
Pounds of pig-meat produced	517	977	1477
Feed used to produce 100 lb. carcase:			
Total (lb.)	910	644	607
As milk (gals.)	678	535	496
As meal (lb.)	102	56	63
As other feed (lb.) .	130	53	48
Returns per cow (500 gals.)*	25/5d.	39/2d.	41/3d.
Last year's returns per cow*	28/4d.	33/9d.	41/2.

*These returns are arrived at by taking pork at 6d. per lb., meal at £14 per ton, other feed at £2/10/- per ton. No deductions are made for labour or overhead costs.

In view of the change-over to baconer production this table is of considerable interest. Those in Group A sell pigs of an average carcass weight of 57 lb., those in Group B of 97 lb., and those in Group C of 107 lb.

At the present time it is most gratifying to be able to report from actual farm returns that the greater the weight of pigs produced, the more profitable is pig production.

Although pigs when small require the least feed to produce a pound of meat, there are advantages in producing baconers. Fewer sows are kept, baconers yield a higher percentage of dressed carcass than porkers, and there is greater elasticity and ease of adjusting pig numbers to the feed supply.

For these and other reasons baconer production is more profitable than weaner pork production. This point of view has been frequently stated in Great Britain during the last few years.

Other Points

The attention of readers is directed to a number of other points. Contrary to the general belief that pigs are most profitable on farms where cows are few and where the number of cows per sow is low, this table shows 36 cows per farm, or seven cows per sow, on the low-producing farm, as against 55 cows, or 14 cows per sow, on the high-producing farm. Group A farmers appear to have lost the advantage of small herds and many sows by failing to get the best use out of their sows; they obtained an average of 11.6 pigs born, while Group C obtained 15 pigs born per sow.

Under the heading "Feed used to produce 100 lb. carcass" the first notable feature is the poor use of feed made by Group A—910 lb. compared with 607 lb. for Group C. The percentage of meal used in each case is similar. Had any group used 20 per cent. of meal the results would have been at least 5s. per cow better (see November "Journal").

Farms Grouped

When these farms have been grouped into those which use other crops and those which do not, it is found that those which grow feed for pigs get a return of 3s. to 5s. per cow better than those which grow no crops. Yet in this case Group A actually grew nearly twice as much crops for pigs as did Group C, and got poorer returns than Group C.

It would seem that, as is the case with the number of sows per cow, the stage is set for high production by Group A, but that inefficient use of the feed provided offsets all the advantages of such feed. The man who produces baconers usually has better facilities for producing pigs, and there is evidence that more thought is given to the job by him than by the man producing baconers and porkers.

CORRECTION.

In the article on seed certification in the December issue under the heading "Brassica Crops" the amount of seed sealed was incorrectly given. The last sentence in the paragraph should have read: "Low yields averaging 3 cwt. per acre were experienced from the 60 acres harvested, and there were finally sealed 30 cwt. of the Broad Leaf Essex type and 146 cwt. of the Giant type."

Hayes' Rabbit Smokers

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With Special Fire Box, £8/17/6

Half-yearly Fertiliser Returns, 1939

THE following returns from January to June, 1939, have been compiled by the Inspector of Fertilisers, Fields Division, Department of Agriculture, from figures furnished by courtesy of the Comptroller of Customs.

Fertiliser.	Origin.	Jan. Tons.	Feb. Tons.	Mar. Tons.	Quarter Tons.	April Tons.	May Tons.	June Tons.	Quarter Tons.	Half-yearly Return. Tons.
Phosphates—										
Rock	Gilbert and Ellice Islands	8,120	16,314	8,286	32,720	6,840	7,191	1,198	15,229	47,949
	Nauru	15,619	5,976	12,245	33,840	5,326	34,305	35,031	74,662	108,502
Total		..	..	..	..	..	..	..	..	*156,451
Slag	United Kingdom	2,709	3,260	2,250	8,219	930	1,620	50	2,600	10,819
	Belgium	275	9,211	3,928	13,414	13,185	1,426	50	14,661	28,075
Total		..	..	..	..	..	..	..	..	38,894
Guano	New Caledonia	..	1,006	..	1,006	603	..	240	843	1,849
	Seychelles	8,400	4,658	..	13,058	..	2,918	..	2,918	15,976
Total		..	..	..	..	..	..	..	..	17,825
Other Phosphate	Tunis	..	5,500	3,000	8,500	6,300	11,999	7,350	25,649	34,149
	Belgium	25	5,472	..	5,497	2,850	100	..	2,950	8,447
	Egypt					1,250	..	..	1,250	1,250
Total		..	..	..	..	..	..	..	..	43,846
Total Phosphates		..	..	..	..	..	..	..	..	257,016
Potash—										
Kainit	Germany	..	..	20	20	15	66	..	81	101
	France	..	20	..	20	..	..	50	50	70
Total		..	..	..	..	..	..	..	..	171
Sulphate	Germany	..	275	..	275	126	..	35	161	436
	France	15	..	155	170	..	5	120	125	295
Total		..	..	..	..	..	..	..	..	731
Muriate	Germany	..	20	..	20	20	15	105	140	160
Other Potash	France	425	1,495	650	2,570	926	370	30	1,326	3,896
	Germany	330	1,470	1,400	3,200	1,786	930	470	3,186	6,386
	Belgium	..	50	..	50	..	..	..	..	50
Total		..	..	..	..	..	..	..	..	10,332
Total Potash		..	..	..	..	..	..	..	..	11,394
Nitrogen—										
Sulphate of Ammonia	United Kingdom	515	150	..	665	315	622	550	1,487	2,152
Nitrate of Soda		..	..	2	2	..	..	..	..	2
	Netherlands	1	..	..	1	..	..	..	..	1
	Germany	..	..	2	2	..	..	..	..	2
	Chile	103	150	65	318	10	410	85	505	823
Total		..	..	..	..	..	..	..	..	828
Total Nitrogen		..	..	..	..	..	..	..	..	2,980
Miscellaneous	United Kingdom	..	21	..	21	29	17	71	119	140
	Netherlands	10	..	..	10	..	..	..	..	10
Total miscellaneous		..	..	..	..	..	..	..	..	150
Totals		36,547	55,048	32,003	123,598	40,511	61,996	45,435	147,942	271,540

* Equal to approximately 300,000 tons of superphosphate.

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Grasses and Clovers of New Zealand

Characteristics of Cocksfoot

— By —

S. H. SAXBY,

Instructor in Agriculture, Dunedin.

Fig. 41.—On much of the high fertility and unploughable country such as this, cocksfoot often dominates, especially when cattle are the more common grazing animal.
[*H. Drake, photo.*

COCKSFOOT (*Dactylis glomerata*). —Cocksfoot is a valuable perennial grass with a wide habitat range, and will grow and produce good feed on all but the wettest and the driest low fertility country. Its chief use is on country that is rather too dry to maintain ryegrass and white clover permanently. Although it will grow well on the better ryegrass country, its value is relatively not as great there.

Cocksfoot is a bushy perennial grass which makes the greater part of its growth during the summer months.

Fig. 42.—Two grasses, the seed heads of which are somewhat similar. Left, cocksfoot; right, reed canary grass.
[*H. Drake, photo.*

This month's instalment of the series of articles on the grasses and clovers of New Zealand deals with grasses which thrive on soils of medium fertility and moisture content. There are some valuable grazing species found in this habitat, and also some distinctly undesirable types of annuals and twitches.

Its spring growth, although early, is not rapid, and is soon overtopped by that of ryegrass. In the mixed pasture cocksfoot shows up to the best advantage on the poorer ryegrass soil types, where, during dry spells, the production from ryegrass is negligible. During these dry spells the production from the cocksfoot is considerable.

Cocksfoot is a shade-loving grass, and when regularly allowed to become rank will soon smother out other grasses until it becomes dominant. Because of these characteristics cocksfoot is best suited to second-class country that is seldom ploughed and is comparatively lightly stocked. Continual heavy stocking will ultimately reduce the amount of cocksfoot. This is brought about largely by the fact that under close grazing cocksfoot will not spread very much, and will not stand up to competition from strong-growing, mat-forming grasses, such as browntop. Close grazing of cocksfoot is also definitely injurious to the crown, which at most times needs some protection of top growth.

Grazing on Hills

The establishment of cocksfoot on the general run of hill country has been found to be both difficult and expensive, especially on unploughable country which is liable to revert to secondary growth. The hard grazing necessary to control the secondary growth makes it difficult for cocksfoot to thrive. On coastal hill country which has a good rainfall cocksfoot will do well so long as grazing is, in the main, confined to cattle.

As soon as sheep grazing is started the replacement of cocksfoot by browntop, sweet vernal, and annual grasses begins. This is exemplified by the present condition of much of the Akaroa and Otago peninsula country which, under sheep grazing, is losing its cocksfoot dominance. The restoration of cocksfoot on this type of country can be brought about only by light grazing and spelling in order that the cocksfoot may smother out the other grasses that have replaced it. This process is much longer than that which has brought about its depletion, and the economics of the practice is questionable.

On ploughable country the hard grazing factor is not of such great importance, as, when the cocksfoot has gone out, resowing is possible. Consequently, such great care in the maintenance of cocksfoot dominance is not as important as on unploughable country.

Establishment

The establishment of cocksfoot is difficult and expensive when small quantities are sown in competition with a heavy seeding of strong-growing ryegrass. Under these conditions cocksfoot takes some two to three years to establish even under a system of fairly lenient management. Frequently, a small seeding of cocksfoot is sown with ryegrass and the pasture is subsequently managed as a ryegrass pasture, that is, by early, close and continuous grazing, all of which, together with the competition, prove too much for the cocksfoot. Under this system of management very little cocksfoot is seen for the first three years or so.

When sown pure, especially if drilled in at a shallow depth, cocksfoot will establish fairly rapidly. A common practice now being adopted is that of drilling in the cocksfoot and then broadcasting the rest of the seeds mixture later. As with most grasses, a firm seed bed is essential for the successful establishment of cocksfoot.

Importance of Management

In the maintenance of cocksfoot-dominant pastures management plays an important part. Two pastures sown and treated similarly may be very different from each other in composition in a few years, depending on the type of management adopted.

Although there are several strains of cocksfoot, only two of them are offered on the New Zealand market. These are the Danish and New Zealand strains, the latter being offered under the various names, New Zealand, Akaroa and plains. The Danish cocksfoot is an excellent seed producer, but has the disadvantages of being short-lived, low in leaf production, and quite winter-dormant. The New Zealand cocksfoot is permanent, very leafy, and in the north produces a fair quantity of winter growth.

Farmers sowing cocksfoot should always purchase New Zealand cocksfoot, even though the seed of the Danish type is frequently much more attractive to the eye. The Department of Agriculture is certifying to the New Zealand type in order that the purchaser may have a guarantee that he is obtaining the long-lived, leafy type and not the short-lived, stemmy type.

Cocksfoot may be recognised by its flattened and almost sharp-edged sheath. The ligule is fairly long and conspicuous. The whole plant is hairless, and by this may be distinguished from prairie grass.

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Fig. 43.—When sown pure or almost pure and grazed lightly in the early stages, cocksfoot will often establish rapidly and successfully

[*S. H. Saxby, photo.*

Crested Dogstail

Crested Dogstail (*Cynosurus cristatus*) is a comparatively low-producing grass. In some cases it is perennial, but remains permanent in pastures chiefly on account of its prolific seeding habit and the fact that stock will not eat the seed heads readily. Its soil fertility and moisure requirements are between those of ryegrass and browntop, being very similar to cocksfoot in these respects. For these reasons crested dogstail forms a prominent position in many sheep pastures on second-class country.

Before the introduction of permanent strains of ryegrass, dogstail was, together with browntop, a valuable constituent of second-class country pastures. With the use of a permanent strain of ryegrass and topdressing the value of dogstail on ploughable country has been greatly lessened.

On hill country where it is firmly established, dogstail is still a valuable grass. It produces its feed, which is very attractive to stock, early in the season, and is usually earlier than ryegrass in this respect.

Crested dogstail will not thrive under shading from other grasses and, although similar to cocksfoot in fertility requirements, will not associate with it when the cocksfoot is regularly allowed to become rank.

Crested dogstail and perennial ryegrass are very easy to confuse in the vegetative state, but may be readily distinguished by the colouration at the base of the stems, which is red in ryegrass and canary-yellow in dogstail.

For Special Purposes

Phalaris Tuberosa is more generally known by its botanical name than by its "common" name of Toowoomba grass. Its greatest virtues are in its adaptability to a wide range of soil conditions and to its winter production. It has been grown at odd times in New Zealand for many years with varying success. The reason for this varying success is due partly to the sowing of the comparatively worthless annual *Phalaris minor* in error, and partly to the lack of knowledge regarding the type of management necessary in order to obtain a satisfactory sward.

Since the certification of *phalaris tuberosa* was begun in Australia, a greater interest has been taken in this grass in New Zealand.

The cardinal points in the establishment of this grass are:—

(1) The sowing of high germinating seed which is true to type.

(2) A fine, firm, and clean seed bed is essential for a good establishment.

(3) Early autumn sowing in order to have the slow establishing plants well rooted before the winter.

(4) Very lenient management in the first year. If possible, a complete avoidance of grazing is advisable during this time.

Competition

Competition from other strong-growing grasses and weeds in the early stages is almost certain to result in a very patchy sward. Because of this, the sowing of *phalaris tuberosa* in a general mixture of grasses and clovers should not be attempted.

Briefly, *phalaris tuberosa* must be regarded as a special purpose pasture grass suitable for the production of winter grass. On this account its use is somewhat limited, and only small paddocks of it should be sown. Once established, *phalaris tuberosa* will stand heavy grazing, especially by

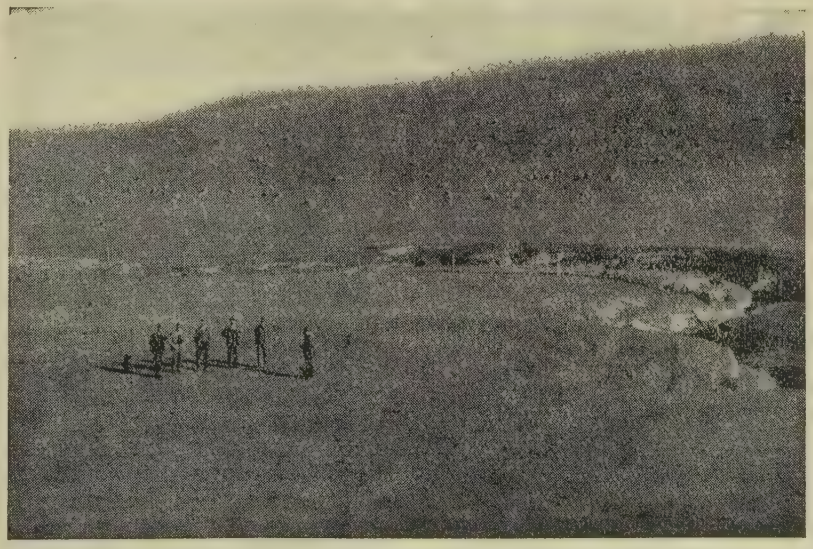

Fig. 44.—Crested dogstail takes a prominent position in many sheep pastures in rolling or hilly sheep pastures.

[*H. Drake, photo.*

Fig. 45.—Seed heads of crested dogstail.
[*H. Drake, photo.*

cattle, and will thrive on a succession of hay crops.

Phalaris tuberosa is tall-growing, deep rooted and perennial. A useful distinguishing feature of this grass is the swollen appearance of the portion of the stem that is at or below ground level. The ligule is very long, being about as long as the leaf is wide.

Bird Seed

Canary Grass (*Phalaris minor*) is an annual grass of little importance, and occurs in small amounts throughout most districts in New Zealand. As it is an annual it is of little value in pastures, and cannot be regarded as a pest in pasture or cereal crops. The only point worthy of note regarding this grass is the similarity that its seed has to that of the perennial, *phalaris tuberosa.*

Until certification of the latter was begun a considerable quantity of *phalaris minor* was sold as *phalaris tuberosa,* with the result that *phalaris tuberosa* was given an unwarranted bad name.

As its name implies, the seed of canary grass is used for the feeding of small cage birds.

Old Man Twitch

Agropyron Repens is also called "old man twitch," "long twitch," and "couch." It is common throughout New Zealand, but is most troublesome on arable country which is under the plough fairly frequently. Because of this it is at its worst in much of the better-class wheat country in Canterbury.

It is a late-growing but vigorous grass, and is relished by all classes of stock. It must be regarded as a weed grass, however, both because of its twitchy nature and because of the fact that on the higher fertility country where it will thrive, better grasses, such as ryegrass, cocksfoot and timothy, will also thrive.

It may be of some value on loose country where, together with *Poa pratensis,* it could be used as a binding agent. As it sets very little seed, it would have to be distributed by means of broadcasting and working in broken up stems and roots.

The methods adopted in the eradication of all twitches are very similar, but vary slightly according to the type of twitch and the type of farming practised.

Eradication

In the eradication of twitches every effort should be made to strike it at its weakest points. In old pastures it will be found that practically all the stems or rhizomes are within a few inches of the surface. By ploughing to a depth of seven or eight inches, where possible, the majority of the roots are turned right under. This ploughing should preferably be carried out in the summer. Following the ploughing, several light but thorough workings should be carried out in order to consolidate the soil preparatory to the sowing of a smother crop in the early autumn.

It is essential that the smother crop be autumn-sown in order that it may get a good start before the twitch begins growth in the spring. If the smother crop is spring-sown, both it or the twitch have an equal chance of surviving. To be really effective, a smother crop should be a very dense heavy crop.

Best Smother Crops

Undoubtedly the best crop for such a purpose is one of oats and vetches at the rate of an equal mixture sown at 3 bushels per acre. The paddocks should be ploughed again immediately the oats and tares have been removed for hay. The choice of succeeding crops should depend on both the effectiveness of the previous treatments and the normal farm rotation.

Fig. 46.—In the establishment of *phalaris tuberosa* a weed-free seed bed should be aimed at, as early competition from other plants will affect the *phalaris* adversely.
[*S. H. Saxby, photo.*

Fig. 47.—Seed heads of three comparatively valueless plants. Left to right, sweet vernal, goose grass and barley grass.
[*H. Drake, photo.*

The eradication of twitch in a paddock which has been under the plough for several consecutive years is a longer process, as no weakening of the twitch can be accomplished by the preliminary and very useful deep ploughing. When setting out to eradicate twitch, every endeavour should be made to start with a pasture at least four years of age.

The only grass with which "old man twitch" is likely to be confused is timothy. These two may be distinguished by the presence of the prominent ears in old man twitch, which are absent in timothy. In old man twitch the sheath and leaf shoot are rolled, and the ligule is short and blunt. The hairiness in various parts is very variable from plant to plant, and is of no value for the purpose of identification.

Fig. 48.—Barley grass is one of several useless annual grasses which gain entry into swards through their opening up subsequent to continuous haying, seeding or tramping. [*H. Drake, photo.*

Goose Grass

Goose Grass (*Bromus mollis*).—This is a very common annual weed grass occurring in open pastures and waste places throughout New Zealand. It is most common in districts which experience a hot, dry summer, and on this account is usually found in seed-producing districts where old pasture ryegrass seed is saved.

Goose grass, like any other annual grass or clover, is greatly encouraged when paddocks are shut up for seed production year after year. Seed production, when carried out continually, weakens both the clover and the ryegrass, and consequently leaves an excellent opening in the sward for the ingress of goose grass and other annuals.

Goose grass ripens its seed somewhat earlier than ryegrass, which results in the shedding of much seed before or during harvest. When this process is repeated several times it is not difficult to understand how goose grass has become practically dominant in many pastures.

The seed of goose grass is, in its natural condition, considerably broader than that of perennial ryegrass, but, if threshed too hard, the sides of the seed are broken off. This results in the goose grass seed being reduced to almost exactly the same shape, size and weight as that of ryegrass. Because of this, seed cleaners have great difficulty in cleaning lines that have been hard-threshed. It is to the ultimate advantage for farmers to see that the goose grass seed is damaged as little as possible when threshing is in progress.

Although stock do not relish goose grass, they will eat it fairly readily when it occurs in small quantities in a pasture. The control of goose grass in pastures is reversing the process that has made it increase. That is, pastures in which goose grass is bad should not be shut up for seed or hay for several years. As far as possible, grazing should be close, at least up to the middle of the summer. Every endeavour should be made to produce a dense sward of good grasses and clovers.

Under these conditions of strong competition and close grazing, goose grass will diminish. The vegetative characters of goose grass are a rounded sheath and leaf bud, and a small ragged ligule, which is very thin. Both the leaves and the sheath are covered with fine hairs. The base of the sheath is slightly veined, as is that of Yorkshire fog. Ears are absent.

Fig. 49.—Continued cropping and the lack of efficient cultivation result in creeping fog and other twitches taking charge. [*S. H. Saxby, photo.*

DELAYS *are* DANGEROUS
EFFECT That POLICY
with the
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TO-DAY

Barley Grass

Barley Grass (*Hordeum marinum*). —This is another annual weed grass, and is common throughout the country. Although it is conspicuous in those pastures in which it occurs, it cannot be regarded as a serious pest, as it usually thrives under conditions where better grasses will also thrive.

Barley grass, to thrive, requires two sets of conditions. Firstly, as it demands high fertility, it will occur only on country where the fertility is naturally high or where it has been induced artificially. Secondly, a loosely-managed and open sward is required for it to become dominant.

Fertility Factor

Barley grass is seldom seen in any quantity throughout the general run of second-class country, but as soon as the fertility of this country is increased to a sufficiently high level, barley grass is sure to appear. Bearing in mind that its requirements are high fertility and an open sward, one can usually find this grass on old stack bottoms where the better grasses have been killed out and on sheep camps, whether they are out in the open or under trees.

Stock are not fond of barley grass, and the seeds are sometimes troublesome in wool.

The control of barley grass is concerned mainly with the maintaining of a close sward of better grasses. Small areas should be cut with the mower to prevent re-seeding, while large areas indicate a run-out pasture, which should be ploughed in any case.

The most striking vegetative character of barley grass is in its prominent, large, clasping ears. This serves to differentiate it from the majority of the common annual grasses. The leaves on both surfaces are dull and hairy. The ligule is short and inconspicuous, and the leaf shoot is rolled.

Creeping Fog

Creeping Fog (*Holcus mollis*) is also called creeping soft grass, and in general appearance is very similar to Yorkshire fog except that it has long, twitchy, creeping, underground stems which render it a most undesirable grass and one of the worst twitches. The distribution of creeping fog is fairly general in districts where much cropping is carried out, and is abundant in parts of Canterbury, where large areas are dominated by it.

The methods to be adopted for the eradication of creeping fog are similar to those for *agropyron repens*. Creeping fog will thrive on poorer country than will *agropyron repens*, and is consequently more difficult to eradicate by the use of smother crops.

The only grasses which are likely to be confused with creeping fog are *agropyron repens* and Yorkshire fog. The two "fog" grasses may be distinguished by the fact that creeping fog is twitchy, whereas Yorkshire fog is not. Yorkshire fog differs from *agropyron repens* in that the former is quite hairy, especially at the nodes, and has no ears.

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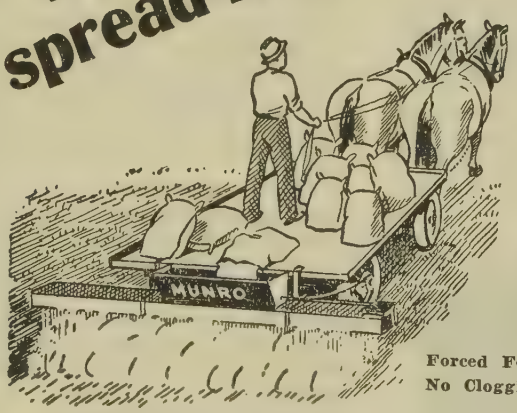

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Topdressing in Auckland Province

Review of Field Experiments In Waikato District

J. F. SHEPHERD, Fields Instructor, Hamilton.

IN the Waikato, perhaps to a greater extent than in any other part of the Dominion, the topdressing of pasture land plays a striking part in the maintenance of production. In fact, it may be said with a great deal of conviction that the Waikato owes much of its prosperity as a dairying and fat lamb producing area to the fact that farmers in that district have quickly appreciated the great aid that manure can offer in building up pasture production.

The Waikato district is selected for discussion in this, the second of a series of articles on topdressing practice in various parts of the Auckland Province. Summarised, the position in the Waikato is that phosphates generally are necessary for pasture production.

Early Topdressing

When topdressing was first introduced the fertilisers used were almost entirely phosphatic. In the main, these were bonedust and basic slag. Our present nearby supplies of rock phosphate and a product of these—superphosphate—were then practically unknown to New Zealand farmers. However, with the outbreak of war in 1914, European supplies of basic slag were cut off, while the rapidly-rising cost of bonedust made its use for pasture topdressing quite prohibitive.

As a result, other supplies of phosphate—chiefly rock phosphate—had to be obtained, and, from these, increasingly large quantities of superphosphate were manufactured. Thus, superphosphate became the standard manure, and, through its general efficiency, it has retained a position of pre-eminence in the Waikato.

While phosphates were satisfactory over a wide area, it was found that there were localities which did not respond well to straight phosphatic manures. Results in some districts were even very disappointing. Consequently, in an endeavour to get better results, many farmers adopted "hit or miss" practices of including quantities of lime, potash, and nitrogenous manures in their mixtures. Where these succeeded all was well, but very frequently their inclusion resulted in little or no change in the pasture position, but certainly in a distinct loss on fertiliser to the farmers concerned.

Obviously the choice of fertilisers for a particular locality should be based on some foundation of knowledge concerning the particular requirements of that area. Chemical analyses do not supply that knowledge in such a way that it can be readily used by the farmer, but a study of soil types, coupled with an examination of field experiments laid down on these soils, does much to elucidate the correct manurial procedure for any locality.

Waikato Soil Types

So far as the Waikato is concerned, there are several main soil types, with many variations. Briefly, these main types are:—

(1) Clays and Silts.
(2) Clay Loams and Loams.
(3) Sandy Loams and Sandy Soils.
(4) Peaty Loams and Peat Soils.

Of these types the clay and silt types are represented by much of the rolling country in the Te Awamutu, Hamilton, and Morrinsville districts. On these soils the response to phosphate is good, but is further improved by liming.

Clay loams and loams are alluvial deposits which are fairly heavy and hold soil moisture well. They respond very well to phosphates and lime. Where these soils gradually merge into sandy deposits the addition of potash has a beneficial effect. Generally speaking, however, the soils indicated in Groups (1) and (2) above are most economically manured by applying 3 cwt. to 6 cwt. of superphosphate with 5 cwt. lime per acre annually on all dairying lands, or on those farms having a high concentration of sheep.

The following table will indicate the results obtained from a number of experiments carried out on these soil types.

TABLE 1.

Farmer.	Soil Type.	Improvement Over No Manure.			
		Lime.	Super.	Potash.	Lime + Super
A. Parkin ..	Hamilton Clay	Slight	Fair	Nil	Good
C. J. Pierce ..	Ohaupo Silt ..	Slight	Fair	Slight	V. Good
F. D. Maisey ..	Clay	Slight	V. Fair	Slight	Good
A. Lovett ..	Clay Loam ..	Slight	Slight	Slight	Good
R. Chilcott ..	Clay Loam ..	Slight	V. Fair	V. Slight	V. Good
H. Lee ..	Clay	Slight	Fair	V. Slight	Good
F. S. Hill ..	Clay Loam ..	Slight	Good	Slight	V. Good

The sandy loams and sandy soils of Group (3) are river deposits of varying depth and fineness. In places these merge into other soil types, but, on the whole, are in fairly well-defined areas. On these soils the response to phosphate is quite satisfactory, but is improved by the addition of potash and lime. In other words, a dressing of all three manures is the most efficient on these soils.

In many respects the peaty soils closely follow the sandy soils in manurial requirements. Here, too, a manure containing phosphate, potash, and lime is required.

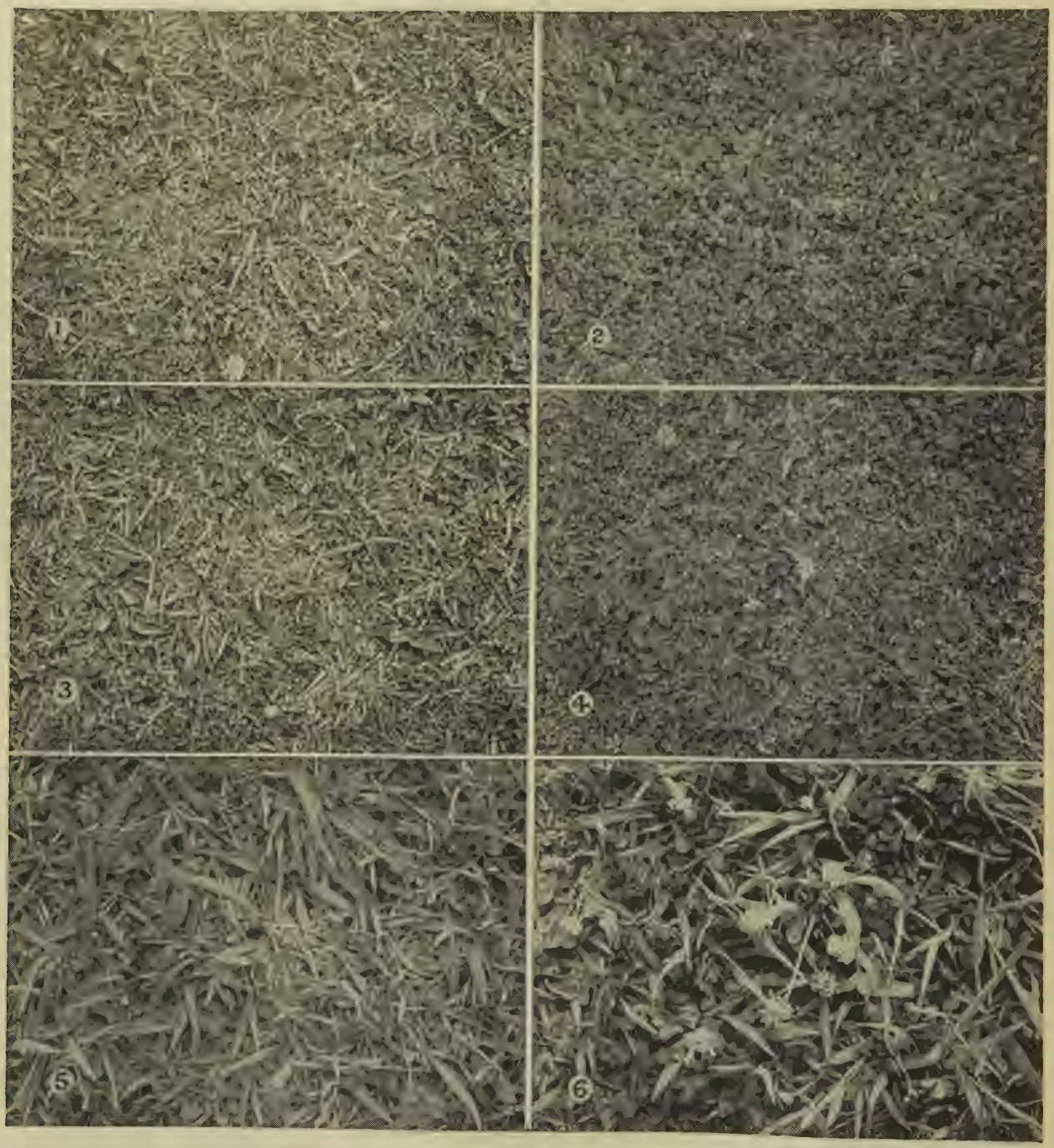

Fig 1—Super alone on clayey soil type, which is typical of much of the rolling country in the Hamilton, Te Awamutu, and Morrinsville districts. *Fig. 2*—Super + lime on same soil as Fig. 1. Note the stronger growth with more clover. *Fig. 3*—Super alone on sandy soil. Only slight response. *Fig. 4*—Super + potash + lime on sandy soil. Pasture much improved. *Fig. 5*—Super alone on peat soil. Pasture lacks vigour. Potash or lime alone give similar results. *Fig. 6*—Super + lime + potash on peat soil. Note the much improved condition of the sward.

However, while the sandy soils do respond to phosphate alone, the peats give a most disappointing result unless lime and potash are also applied. In fact, it could be said that manuring with phosphate alone is uneconomic on these soils.

In Table 2 a number of experiment results are set out:—

TABLE 2.

Farmer.	Soil Type.	Improvement Over No Manure.			
		Lime.	Super.	Potash.	Lime + Super + Potash.
A. G. Boyd ..	Sandy Loam ..	Slight	Slight	Fair	Excellent
N. Reid ..	Sandy Loam ..	Slight	Fair	Fair	Excellent
S. Reid ..	Sandy Loam ..	Slight	Fair	Slight	Good
K. S. Gorrie ..	Sandy Loam ..	Slight	Good	Slight	V. Good
R. S. Ranby ..	Peaty Loam ..	Slight	Slight	Slight	Good
A. B. Bishop ..	Peat	Slight	Slight	Fair	V. Good
A. G. Howe ..	Peat	Fair	Fair	Slight	V. Good
F. W. Thomas	Peat	Slight	Slight	Slight	Good
F. N. Howe ..	Peaty Loam ..	Slight	Fair	Slight	Good

Conclusion

Summarised, the position in the Waikato is that phosphates generally are necessary for pasture production. In fact, they are essential, and, in the main, a quick-acting form such as superphosphate is desirable. On all clayey, silty, loamy, and sandy soils, some immediate response from phosphates may be expected.

However, on all these soils the addition of lime improves production, while, on the sandy soils, potash is also necessary for highest returns.

On the peats, phosphate must be supplemented by lime and potash before payable results may be expected.

Acknowledgements

Thanks are due and tendered to the above-mentioned farmers and many others for their co-operation in conducting field trials; to officers of the Soil Survey Division for their classification of soils; to Fields Division officers who carried out the various experiments; and to Mr. H. Drake for photographs illustrating this article.

Slaughterings of Stock

THE following returns of slaughtering of stock at meat-export slaughterhouses and abattoirs for the seven months, May-November, 1939, has been compiled by the Livestock Division:—

During the period under review the estimated number of lambs tailed was 17,017,395.

District	Cattle	Calves	Sheep	Of which Ewes were	Lambs	Swine
North Island						
Meat-export Slaughterhouses—						
Auckland	90,222	557,089	51,403	23,867	128,155	86,641
Poverty Bay-Hawke's Bay	20,905	59,211	109,859	35,441	368,222	9,019
Taranaki-Manawatu ..	49,981	221,837	59,666	29,007	211,900	51,633
Wairarapa-Wellington ..	16,149	17,965	44,320	16,169	97,794	10,825
Totals	177,257	856,102	265,248	104,484	806,071	158,118
Abattoirs	71,907	24,022	289,551	151,484	24,454	60,278
North Island Totals ..	249,164	880,124	554,799	255,968	830,525	218,396
South Island						
Meat-export Slaughterhouses—						
Nelson-Marlborough ..	604	9,675	5,540	2,121	25,014	2,693
Canterbury	6,435	39,474	154,135	111,999	436,434	14,942
Otago-Southland	3,354	40,260	62,763	39,995	572,468	2,414
Totals	10,393	89,409	222,438	154,115	1,033,916	20,049
Abattoirs	33,627	7,737	165,691	80,331	14,378	16,681
South Island Totals ..	44,020	97,146	388,129	234,446	1,048,294	36,730
Dominion						
Meat-expt. Slaughterhouses	187,650	945,511	487,686	258,599	1,839,987	178,167
Abattoirs	105,534	31,759	455,242	231,815	38,832	76,959
Grand Totals	293,184	977,270	942,928	490,414	1,878,819	255,126
Same Period, 1938: Meat-export Slaughter houses and Abattoirs ..	278,337	945,963	1,046,119	585,238	1,718,591	348,384
Same Period, 1937: Meat-export Slaughter houses and Abattoirs .	293,070	995,920	846,922	443,357	2,093,603	400,727

Kudzu Vine

A.T.W. (NEW PLYMOUTH):—

Is the Kudzu vine palatable to stock? Would it be suitable for growing on an island in a river subject to inundation and at present carrying a growth of tall fescue and convolvulus, with some gorse and blackberry?

Are cuttings of the vine procurable to New Zealand?

Is the vine winter-dormant, and would it be suitable for a rough run-off for dairy stock?

If you could reply through the "Journal" I am a constant reader.

FIELDS DIVISION:—

This plant has not been introduced into New Zealand, and cuttings are therefore not available.

The conditions under which it grows and is used in the United States indicate that it would have possibilities only in the far north of New Zealand. The vine is winter-dormant, and frosts entirely kill off the summer growth. It is said to be suitable for rough summer feed for cattle, but does not stand continuous grazing. I do not think it likely to prove of great value under the conditions mentioned.

For these conditions, namely, an island in a river subject to inundation, I would recommend planting the area with pampas grass and using this plant for a winter run off for cattle. Pampas grass is already being used successfully on blackberry and gorse-infested areas adjoining some of the rivers in Taranaki.

Pedigree Sow Records

Contributed by the LIVESTOCK DIVISION.

OF the 137 sows recorded for the quarter ended November 30, 1939, 80 had litters sufficiently good to be included in one of the five grades set out below:—

Grade	Litter Weight	
	At 3 weeks	At 8 weeks
1	120 lb.	360 lb.
2	100 lb.	300 lb.
3	90 lb.	270 lb.
4	80 lb.	240 lb.
5	70 lb.	210 lb.

THE following table sets out the performance of each breed as an average for all sows recorded during the quarter:—

Averages.

Breed.	No. of Sows.	No. of Pigs per Litter.		Litter Weight at		Weight per Piglet.	
		Born.	Weaned.	3 Weeks.	8 Weeks.	3 Weeks.	8 Weeks.
Berkshire ..	46	9.5	7.4	73	226	9.8	30.5
Large Black ..	15	9.0	6.6	74	226	11.1	33.9
Large White ..	18	10.3	8.0	94	300	11.7	37.5
Tamworth ..	58	8.9	7.0	79	240	11.3	34.3

In the following list the owner's name and address are given along with the herd book number of the sire and sow, the weights at three and at eight weeks, the number of pigs born and weaned, and the grade of the litter.

Berkshires.

Owner's Name and Address.	Herd Book No. of—		Litter Weight (lb.)		No. of Pigs		
	Sire.	Dam.	3 weeks	8 weeks	Born	Weaned	Grade of Litter.
Awakino Point Pig Club, c/o. J. Williams, Hon. Sec. Awakino Point, Dargaville	13459	12809	72	225	10	8	5
Bliss, E. T., Parkvale, Carterton	15057	15063	57	192	8	6	—
Brown, Geo., Puha	13858	12961	102	351	10	10	2
Burmeister, O. P., Kairanga R.D., Palmerston North ..	12859	13989	53	140	5	4	—
	12859	13206	80	240	11	8	4
	12859	13211	61	180	8	8	—
Catlins Pig Club, c/o. W. E. Wright, Hon. Sec., Owaka	13482	13672	93	299	13	13	3
Collins, T., Kopane R.D., Palmerston North	13404	14943	41	88	7	4	—
Dron, W. D., R.M.D., Richmond, Nelson	11718	12322	99	247	11	8	4
	11718	14465	94	253	11	9	4
Drury Pig Club, c/o. J. A. Paterson, Hon. Sec., Opakeke R.D., Papakura	14609	14603	37	110	10	4	—
	12902	12942	118	385	12	10	2
Jackways Bros., Kainui, Taupiri	12468	14301	103	302	9	9	2
Kaeo Pig Club, c/o. J. W. Hayes, Hon. Sec., Kaeo ..	13680	12828	54	115	7	5	—
Kahungunu Pig Club, c/o. R. Gilmore, Secretary, Nuhaka, Wairoa, H.B.	13858	12811	106	357	11	8	2
Kaingaroa Pig Club, c/o. G. A. Morphett, Hon. Sec. R.D., Kaitaia	13679	12810	77	302	8	8	5
Kaitaia Pig Club, c/o. W. J. Bell, Secretary, Kaitaia ..	13405	13678	73	250	10	10	5
Larsen, O. C., Rural Delivery, Umutaoroa	13466	11817	71	184	8	5	—
	14391	13356	71	190	11	8	—
	13466	13357	82	165	9	6	—
	14391	13354	69	191	8	6	—
	12773	14908	58	247	12	9	—
Leslie, R. C., R.D., Whakatane	13410	12188	78	139	9	6	—
Manutuke Pig Club, c/o. R. K. Hepburn, Secretary, Manutuke, via Gisborne	13858	13606	113	348	11	9	2
Matatoki Pig Club, c/o. S. E. Hall, Matatoki, Thames ..	14609	14605	34	84	6	4	—
Motukarara Pig Club, c/o. W. C. Miller, Motukarara ..	12818	12880	75	302	11	9	5
Ngakura Young Farmers' Pig Club, Ngakura R.D. Rotorua	12803	13569	67	181	10	5	—
Okaihau Pig Club, c/o. F. W. Jordan, Okaihau ..	14059	12791	58	254	11	8	—
Omokoroa Pig Club, c/o. E. Adams, Omokoroa, Tauranga	14561	12836	80	289	13	8	4
Otakiri Pig Club, c/o. L. Cristall, Otakiri, Bay of Plenty	13755	13664	83	268	9	7	4
Otamarakau Pig Club, c/o. M. Cameron, R.D., Te Puke	13443	13604	82	300	9	8	4
Parkvale Pig Club, c/o. E. T. Bliss, Parkvale, Carterton	14090	14880	42	109	8	4	—
Pitcaithly, R., Mata, Eltham	14661	14333	97	313	11	10	3
Pohangina Pig Club, c/o. T. J. Spelman, Raumai ..	14744	14589	77	266	8	7	5
Pongakawa Pig Club, c/o. A. E. Nettlingham, R.D., Te Puke	13443	13807	46	161	9	5	—
Rangitira Pig Club, c/o. C. Mills, Te Karaka, via Gisborne	13858	12598	105	347	8	8	2
Rongotea Pig Club, c/o. J. P. Gloyn, Rongotea	12227	13208	43	113	6	4	—
Ruakaka Pig Club, c/o. J. C. Sandford, Ruakaka ..	14065	12814	60	242	8	7	—
Ruatoki Pig Club, c/o. D. P. Hawiki, Ruatoki North Whakatane	13755	12550	96	272	17	13	3
Stokes, N. W., R.M.D., Kaikoura	13980	13787	59	201	9	5	—
Swann, D., Tikitiki	13466	14794	48	186	8	6	—
Takahue Pig Club, c/o. W. S. Masters, Takahue ..	13405	14195	79	250	10	10	5
Te Poi Pig Club, c/o. G. L. Bellamy, Te Poi R.D. Matamata	13434	14357	125	330	13	12	2
Tikitiki Pig Club, c/o. J. E. Omundsen, Tikitiki ..	12227	14882	53	127	10	8	—
Torere Pig Club, c/o. Hori Mio, Torere, Opotiki ..	13024	14375	52	105	9	7	—
Waiuku Pig Club, c/o. W. S. Morrin, Waiuku	12247	13582	75	206	6	6	—

Owner's Name and Address.	Herd Book No. of—		Litter Weight (lb.)		No. of Pigs		
	Sire.	Dam.	3 weeks	8 weeks	Born	Weaned	Grade of Litter.
Large Blacks.							
Bell, R. G., Pukekawa, R.M.D., Tuakau	1861	2258	97	262	7	7	4
Boland, Mrs. R. A., "Crystal Brook," Longford, Nelson	1928	1342	102	300	8	8	2
	1928	1686	47	184	12	7	—
	1928	1688	84	275	8	8	4
	2035	1961	89	177	10	7	—
Gulliver, J. A. N., R.D., Te Puke, Bay of Plenty	2268	1693	45	142	4	3	—
Kereone Pig Club, c/o. E. Topham, Custodian, Kereone, Morrinsville	2272	1990	77	289	14	10	5
Ngongotaha Pig Club, c/o. K. M. Martin, Box 13, Ngongotaha	1237	1651	76	209	6	5	—
Omeheu Pig Club, c/o. J. E. Mussett, Box 12, Whakatane	1352	1911	43	142	9	4	—
Pio Pio Pig Club, c/o. G. C. Sheffield, Pio Pio	1930	1738	87	267	9	8	4
Rangiriri Pig Club, c/o. C. R. McCutchan, Rangiriri	1861	1739	70	197	10	6	—
Rotorua Pig Club, c/o. B. Bray, P.O. Box 161, Rotorua	861	1654	102	241	8	7	4
Te Matai Pig Club, c/o. K. H. Rolfe, Te Matai Road, Te Puke	1691	1934	55	207	8	7	—
Turner, C. F., P.O. Box 161, Rotorua	2271	2108	41	126	11	5	—
Whitelock, G. M., Newbury R.D., Palmerston	861	1718	101	371	11	8	2
Large Whites.							
Canterbury Agric. College, Private Bag, Christchurch	4763	4875	71	203	7	5	—
	4763	4765	112	312	9	8	2
Hamilton, W. T., 17 C, Totara R.D., Oamaru	5066	4149	73	171	10	5	—
Keiller, B. E., Box 272, Palmerston North	Utility Bradbury 4th	4938	76	267	13	7	5
	4669	4937	93	272	10	8	3
	4659	4998	124	468	14	11	1
Mortensen, H. C., Mauriceville West	4895	5068	106	392	18	12	2
Mosley Bros., Stirling	5069	5067	116	296	9	9	3
Myers, N., Mauriceville East	4895	5065	148	486	11	10	1
Norsewood Pig Club, c/o. Mrs. M. E. Jenkins, R.D. Norsewood	2382	4860	131	401	13	10	1
Patetonga Pig Club, c/o. R. McCullough, Patetonga R.M.D.	4988	4899	94	287	12	11	3
Rowlands, T. E., Ruthin R.M.D., Kaiapoi	4548	4164	68	242	9	8	—
	4548	4986	73	217	10	7	5
	4548	4984	85	260	6	6	4
	4548	4985	124	424	8	8	1
	4548	4437	83	291	8	7	4
Whitelock, G. M., Newbury R.D., Palmerston North	5108	5147	83	303	10	9	4
	5108	5031	42	110	8	3	—
Tamworths.							
Ararimu Pig Club, c/o. I. L. Chamberlain, Ararimu	8970	10885	59	197	6	6	—
Awakeri Pig Club, c/o. W. J. Hepburn, Awakeri, Whakatane	10220	10628	46	137	4	4	—
Awamate Pig Club, c/o. W. Richmond, Awamate, Wairoa	9637	9722	110	406	11	11	2
Barnes, W. E., Pilot Station, Patea	10707	10240	77	256	10	8	5
Bird, W. H., Mauriceville, Masterton	9916	10070	98	288	9	8	3
Canterbury Agric. College, Private Bag, Christchurch	8820	9729	130	363	10	9	1
Dalefield Pig Club, c/o. W. Press, Dalefield, Carterton	9885	10072	83	276	11	7	4
Deck, G. M., R.D., Upper Moutere	10106	10107	92	328	10	9	3
Feilding Pig Club, c/o. R. N. Watson, Agricul. College, Feilding	5186	10046	99	323	9	9	3
Geraldine-Orari Pig Club, c/o. M. Brophy, Pleasant Point, Geraldine	10565	11312	72	232	8	7	5
Glen Oroua Pig Club, c/o. W. C. Scott, R.D., Glen Oroua	10050	8479	86	206	7	6	—
Gulliver, J. A., R.D., Te Puke, Bay of Plenty	9142	10292	56	157	8	4	—
Hauiti Pig Club, c/o. W. M. O'Connell, Tolaga Bay	10113	8967	62	173	10	6	—
Hickmott, E. J., North Road, Belfast, Christchurch	9994	10569	67	204	9	4	—
	9994	7729	113	346	11	8	2
Hohonu Pig Club, c/o. H. Beckett, Hohonu, via Numara, Westland	10339	10121	85	184	7	7	—
Inangahua Pig Club, c/o. J. D. O'Regan, Inangahua Landing, Reefton	11444	10138	96	306	11	9	3
Kaihere Pig Club, Kaihere R.D., Ngatea	10484	10096	72	205	10	5	—
Kaikoura Pig Club, c/o. F. Sharp, Box 44, Kaikoura	10501	10289	89	263	9	6	4
Kaipara Flats Pig Club, c/o. B. Andrews, Kaipara Flats	10154	9723	102	272	8	7	3
Karaka, P., Tikitiki	10169	11176	82	153	11	9	—
Karamea Pig Club, c/o. T. H. Jennings, R.M.D., Karamea	10338	10122	72	236	8	6	5
	10338	10135	107	232	13	10	5
Kaukapakapa Pig Club, c/o. F. Taylor, Kaukapakapa	9918	5879	47	150	11	5	—
Kauri Pig Club, c/o. C. W. Bell, Kauri, Whangarei	10173	9438	72	284	11	8	5
Kirkland, W., "Elmgrove," Mosgiel	9613	10384	140	191	8	8	—
Knight, Mrs. R., Westmere, Wanganui	10747	10745	54	183	6	6	—
	11187	11200	92	333	11	11	3
Kopane Pig Club, c/o. E. C. N. Whitelock, Kopane R.D. Palmerston North	10450	11035	80	215	10	6	5
Kumeu Pig Club, c/o. J. H. Outram, Huapoi, Kaipara Line	9906	8670	43	144	9	5	—
Linton Pig Club, c/o. E. H. Bowler, Linton	11024	9747	69	202	8	5	—
Mahakipawa Pig Club, c/o. W. E. Bryant, Mahakipawa	9433	9666	63	146	7	3	—
Martinborough Pig Club, c/o. F. B. Wright, Tawaka, Martinborough	10446	9748	64	203	10	7	—
Muff Bros., Ohapi, Orari	10213	7466	100	283	8	7	3
Okaihau Pig Club, c/o. F. W. Jordan, Okaihau	10677	9727	60	183	9	7	—
Omeheu Pig Club, c/o. J. E. Mussett, Box 12, Whakatane	10407	10694	85	211	9	7	5

Tamworths—(continued).

Owner's Name and Address.	Herd Book No. of—		Litter Weight (lb.)		No. of Pigs		
	Sire.	Dam.	3 weeks	8 weeks	Born	Weaned	Grade of Litter.
Otautau Pig Club, c/o. D. Y. Russell, Aparimu R.D. Otautau	10050	11106	74	236	6	6	5
Philpott, M. E., Medbury, R.M., Hawarden	10340	6775	94	326	10	9	3
Pio Pio Pig Club, c/o. G. C. Sheffield, Pio Pio	3049	11224	20	48	11	3	—
Pokeno Pig Club, c/o. K. Munro, Box 3, Pokeno	10921	10425	61	227	8	6	—
Rangitukia Pig Club, J. E. Omundsen, Tikitiki	10263	8911	58	196	8	5	—
Rongotea Pig Club, c/o. J. P. Gloyn, Rongotea	6766	10550	81	224	8	7	5
Ruatoria Pig Club, c/o. C. Wilson, Takamore, Ruatoria	10258	9882	88	255	12	9	4
Scott, W. C., R.D., Glen Oroua	10050	10922	101	330	9	8	2
	10050	9759	93	318	10	9	3
South Featherston Pig Club, c/o. R. Foss, Featherston	5757	9746	90	270	8	8	3
South Otago Pig Club, c/o. W. R. Christie, "Blair Athol," Balclutha	10680	10318	83	270	7	6	4
Tatuanui Pig Club, c/o. C. Rushton, Tatuanui	7289	10092	84	264	11	8	4
Te Arai Pig Club, c/o. F. Robb, Manutuke, Gisborne	8262	9911	62	203	6	5	—
	8262	9574	77	238	10	7	5
Te Matai Pig Club, c/o. K. H. Rolfe, Te Matai Road Te Puke	9142	10184	52	123	9	5	—
Tikitiki Pig Club, c/o. J. E. Omundsen, Tikitiki	10169	9465	60	163	10	7	—
Waerenga Pig Club, c/o. F. D. Holt, Waerenga	9478	10052	78	274	8	7	5
Waikiekie Pig Club, c/o. P. Leech, Waikiekie	10576	9919	65	289	9	9	—
Wairau Pig Club, c/o. F. A. Parker, Spring Creek Marlborough	10959	10296	122	308	9	9	2
Wairoa Pig Club, c/o. Mrs. Watson, Mahia Ave., Wairoa	9714	9697	126	439	10	10	1
Whitianga Pig Club, c/o. J. W. Lauder, Whitianga	9975	10056	71	213	7	6	5
Wilson, C. M., Ruatoria	10258	10170	84	234	8	7	5

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Winner of competitions and judged as the best calf in Royal Show, Hamilton, 1938, is another example of what Codlivine can do in the growth of stock. Codlivine is manufactured with the finest Codliver Oil, full of vitamins A and D.
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P.O. BOX 460 WELLINGTON

Apples As A Pig Feed

Under Proper Management Pigs Will Turn Waste or Reject Apples Into Clear Profit

M. J. SCOTT, Superintendent of the Pig Industry, Wellington.

The utilisation of waste or reject apples as pig feed has been investigated in Motueka and Christchurch, and it has been shown that if adequate supplementary feed is also provided and the pigs are kept under good conditions a profit of from 6d. to 1s. a case may be expected from this class of apple.

AS a result of trials recently conducted in Motueka and Christchurch, it can be safely said that waste and reject apples return a clear profit of from 6d to 1s per case when fed to pigs which are turned off as bacon.

Apples contain approximately 18 to 20 per cent. of dry matter, so that 4lb of apples are equivalent to 1lb of feed of barley quality. Under reasonably careful feeding conditions— that is, by never allowing pigs to be starved, and by keeping them free from parasites and illness through reasonable housing and attention—1lb of pig-meat (carcass) can be produced for 6lb of feed. The average for New Zealand is nearer 7lb of feed, although many farmers produce it for 5lb. The theoretical minimum is 4lb of feed for 1lb of meat.

On the basis that 1lb of meat is produced for 24lb of apples, the earning capacity of apples is approximately 10d per case of 40lb. On a conservative basis, and making allowance for purchased meat-meal, which must be used at the average rate of at least 1lb per pig daily, the value per case is at least 8d.

In an actual trial conducted recently at Motueka it has been shown that the apples fed to pigs return 1s per case after all outgoings are met. This return is above the average expected return quoted above, probably because in this instance the all-the-year-round feeding has not been allowed for. There will be months when no apples are available, such as November, December, and January at least. Other feed will have to be provided to carry store pigs during this period.

Supplementary Feed

It will be necessary to provide supplementary feed with the apples. The main source of this supply, required in October, November, December, January, and February, could be readily provided from lucerne, clover, grass, or other grown crop. If sows were farrowed in June and December both litters could be turned off as bacon in the flush of the apple season.

Big Value for 6d.

New Railways Timetable

When you pay 6d. for the Railways Timetable (popularly known as the "POCKET GUIDE") you make a very good investment. In addition to the full timetables for rail and road services, the book gives you all manner of helpful information about passenger, freight and parcels services.

A very interesting section of 26 pages is the "Locality Guide," an alphabetical list of towns, townships or suburbs, and their distances from the nearest railway stations.

As the Centennial traffic will increase the demand for the new edition, you are advised to buy one as soon as you can.

A Huge Feast of Facts for SIXPENCE

The June litter would have to be carried through as summer stores on pasture and meat-meal when no apples were available, and finished off in the early part of the apple season. The December litter would be weaned on to apples and finished as bacon at the end of the apple season.

On the assumption that the equivalent of 1000 cases of apples are not gathered or are rejected on a 15-acre orchard, it is recommended that one sow be kept to deal with this quantity. One sow could be kept for each additional 1000 cases that are unmarketable. Many farmers have had little success with feeding apples, chiefly because they went the easy way about it, and were not prepared to adjust their ideas to fit the circumstances. They bought pigs too dear, had insufficient equipment, and used insufficient supplementary feeds.

Because of these experiences an outline is given of the programme of feed and costs and returns for one sow and her two litters to bacon in a year. Approximately 1000 cases of apples, half a drum of molasses, one ton of meat-meal, 36 bushels of barley, and two acres of grazing, at a total cost of £24, gives a return of 14 baconers of 150lb carcass, worth more than £50. The equipment necessary would be approximately £30 per sow. The following details are worth careful study by anyone interested, and the thanks of the Department are due to the Christchurch District Pig Council and farmers in Motueka and Christchurch districts who have assembled these data.

Sows Farrowing December—Baconers following August.

(Including November to January farrowing period).

One Sow and Litter of seven Pigs.

FEED REQUIRED.

			Average Amts. Req. Daily.		Total feed Reqd.	
December to February	Sow suckling	Molasses	2 lb.	=	120 lb.	= ¼ drum
	60 days' feeding	Meat-meal	2 lb.	=	120 lb.	= 1 cwt.
	Weaning weights, 35 lb.	Barley	4 lb.	=	480 lb.	= 10 bushels
	and grazing or pasture, clover, lucerne, carrots.					
February to April	7 weaned pigs	Meat-meal	½ lb.	=	210 lb.	= 2 cwt.
	60 days' feeding	Barley	1 lb.	=	420 lb.	= 8 bushels
	35 to 70 lb. live weight	Apples	4 lb.	=	1,680 lb.	= 42 cases
April to August	7 fattening pigs	Meat-meal	¾ lb.	=	735 lb.	= 7 cwt.
	140 days' feeding	Apples	20 lb.	=	19,600 lb.	= 490 cases
	70 to 200 lb. live weight					

COST OF BOUGHT FEED.		VALUE OF PIGS PRODUCED.	
½ drum molasses at £2 per drum	£0 10 0	7 baconers, 150 lb. carcasses, at 6d. per lb.	£26 5 0
10 cwt meat-meal at £14 per ton	7 0 0	Less feed costs	12 0 0
18 bushels barley at 5/- per bushel	4 10 0		
Total feed costs	£12 0 0	Return for 532 cases apples fed	£14 5 0

The return works out at approximately 6d. per case.

Sows Farrowing June—Baconers following April.

(Including June to August farrowing period).

One Sow and Litter of seven Pigs.

FEED REQUIRED.

			Average Amts. Req. Daily.		Total feed Reqd.	
June to August	Sow suckling	Molasses	2 lb.	=	120 lb.	= ¼ drum
	60 days' feeding	Meat-meal	2 lb.	=	120 lb.	= 1 cwt.
	Weaning weight, 35 lb. per pig	Barley	2 lb.	=	120 lb.	= 2 bushels
		Apples	32 lb.	=	1,920 lb.	= 48 cases
August to October	7 weaned pigs	Meat-meal	½ lb.	=	210 lb.	= 2 cwt.
	60 days' feeding	Barley	½ lb.	=	210 lb.	= 4 bushels
	35 to 70 lb. live weight	Apples	8 lb.	=	3,360 lb.	= 84 cases
October to January	7 store pigs	Meat-meal	½ lb.	=	315 lb.	= 3 cwt.
	90 days' feeding	Barley	1 lb.	=	315 lb.	= 12 bushels
	70 to 130 lb. live weight	Pasture or good grazing, at least 2 acres.				
January to April	7 fattening pigs	Meat-meal	1 lb.	=	420 lb.	= 4 cwt.
	60 days' feeding	Apples	25 lb.	=	10,000 lb.	= 250 cases
	130 to 200 lb. live weight					

COST OF BOUGHT FEED.		VALUE OF PIGS PRODUCED.	
½ drum molasses at £2 per drum	£0 10 0	7 baconers, 150 lb. carcasses, at 6d. per lb.	£26 5 0
10 cwt. meat-meal at £14 per ton	7 0 0	Less feed costs	12 0 0
18 bushels barley at 5/- per bushel	4 10 0		
Total feed costs	£12 0 0	Return for 382 cases apples fed	£14 5 0

The return works out at approximately 9d. per case.

Certificate-of-Record Testing of Purebred Dairy Cows

Contributed by the DAIRY DIVISION.

The following list includes details of the production of cows which have been awarded certificates during November, 1939:—

YEARLY DIVISION—FIRST CLASS.

Jerseys.

Name of Cow and Class	Tested by	Age at Start of Test.	Fat required for Certificate.	Yield for Season:		
				Days	Milk	Fat
Junior Two-year-old		Yrs. Dys.	lb.		lb.	lb.
Kass Goldies Promise	W. D. Dron, Nelson	2 31	278.6	365	10,503.9	680.25
Totarabank Necklace	W. D. Dron, Nelson	2 41	279.6	365	11,354.4	586.75
Croydon Fern's Jean	W. Crosby, Waipuku	2 30	278.5	365	9,864.0	584.23
Belle's Golden Pattie	W. D. Dron, Nelson	2 13	276.8	336	9,487.2	561.20
Hatcliffe Royal Gay	H. J. Kaye, Stratford	1 264	275.5	365	8,693.3	546.83
Hatcliffe Royal Tess	H. J. Kaye, Stratford	2 3	275.8	365	9,340.5	528.31
Croydon Fern's Melba	W. Crosby, Waipuku	1 333	275.5	365	9,361.7	526.83
Naylands Fancy	W. C. Brears, Southbridge, Cant.	2 12	276.7	365	9,103.9	525.05
Naylands Viola	W. C. Brears, Southbridge, Cant.	1 343	275.5	365	8,660.2	468.85
Tyntesfield Fairy Quest	Mrs. E. Garland, Matamata	1 10	275.5	365	7,570.5	456.12
Hatcliffe Royal Nell	H. J. Kaye, Stratford	2 11	276.7	365	7,314.8	464.68
Hatcliffe Royal Bessie	H. J. Kaye, Stratford	2 22	277.7	365	8,013.5	448.61
Hatcliffe Mildred	H. J. Kaye, Stratford	2 21	277.6	364	7,581.7	445.70
Hatcliffe Alma	H. J. Kaye, Stratford	2 10	276.5	365	7,633.1	430.19
Hatcliffe Helena	H. J. Kaye, Stratford	2 4	275.9	359	7,770.8	421.80
Tyntesfield Romance	Mrs. E. Garland, Matamata	1 357	275.5	364	7,367.0	416.88
Ashgrove Felicity	A. Worthington, Mareretu	1 357	275.5	365	7,236.1	414.69
Pakowhai Butterfly	H. J. Fourneau, Pakowhai, Hastings	2 24	277.9	334	7,051.9	410.42
Fortlands Helene	Alex. M. Stewart, Te Kawa	1 337	275.5	365	6,677.3	397.49
Craigknoll Tactful	J. H. Williams, Waharoa	2 2	275.7	365	6,171.9	364.36
Tyntesfield Lady Bess	Mrs. E. Garland, Matamata	1 353	275.5	365	7,387.1	361.74
Tyntesfield Gold Lass	Mrs. E. Garland, Matamata	2 20	277.5	364	6,758.6	357.46
Jack's Fawn Beauty	G. Scott, Silverdale	1 288	275.5	321	5,955.7	334.86
Croydon Zelda	W. Crosby, Waipuku	1 355	275.5	261	5,315.1	320.42
Senior Two-year-old						
Wattle Grove Tulip	W. Robinson, Patumahoe	2 311	306.6	365	7,806.6	454.83
Blythe Penelope	F. B. Starky, Toa Toa	2 253	300.8	365	7,019.7	373.73
Blythe Roundelay	F. B. Starky, Toa Toa	2 239	299.4	294	5,667.6	303.63
Three-year-old						
Hampton Lady's Maid	A. M. Bell, Otorohanga	3 291	341.1	365	11,075.0	678.55
Ubors Kathleen	R. J. Wilson, Putaruru	3 304	342.4	365	11,668.1	637.82
Marua Elspeth	T. Ranford, Whakarongo	3 320	344.0	365	9,644.4	616.63
Selside Gold Queen	John Gibson, Stratford	3 351	347.1	365	9,744.0	610.48
Waveney Linda	E. Aldis, Feilding	3 8	312.8	365	7,431.2	526.95
Fairy Meadows Rosemary	A. Hazelton, Waihou	3 338	345.8	344	8,130.9	487.73
Pencarrow Gladys	Mrs. M. T. Hastie, Mangatawhiri	3 —	312.0	288	6,575.2	428.92
Four-year-old						
Hampton Sybil's Gipsy	A. M. Bell, Otorohanga	4 339	382.4	365	12,247.1	689.37
Craigalea Tessie	J. G. Robertson, Eltham	4 360	384.5	365	10,107.7	594.72
Almadale Blonde Maiden	The Misses Kilgour, Feilding	4 352	383.7	365	10,554.3	541.31
Glenmore Sunbeam	D. & J. S. Pattison, Kihikihi	4 318	380.3	365	9,267.7	536.91
Glenmore Treasure	D. & J. S. Pattison, Kihikihi	4 360	384.5	365	8,923.0	528.47
Craigalea Rosie	J. G. Robertson, Eltham	4 364	384.9	365	9,072.6	504.69
Punga Nui Joyce	A. Stewart, Tirau	4 316	380.1	279	8,595.5	491.09
Jersey Hill Speckle	W. H. Ridge, Norsewood	4 29	351.4	336	7,939.1	487.77
Torwood Dilly	Mrs. M. E. Pemberton, Tauranga	4 14	349.9	365	9,008.8	480.82
Ridgway Happy Days	A. Worthington, Mareretu,N. Auckland	4 351	383.6	365	8,156.5	469.08
Success' Pearl	A. Hazelton, Waihou	4 346	383.1	333	7,389.4	444.18
Ashgrove Laurelette	A. Worthington, Mareretu.N. Auckland	4 12	349.7	365	7,171.4	417.65
Mature						
Crestdale Delicious	Griffin Bros., Richmond, Nelson	5 337	385.0	363	11,206.1	684.30
Craigalea Josie	J. G. Robertson, Eltham	5 4	385.0	365	10,391.1	674.60
Reketi Jessie	C. S. Leggett, Auckland	5 33	385.0	365	11,274.8	635.44
Ruanehu Primrose	H. V. Benge, Feilding	6 2	385.0	311	10,189.2	573.73
Maitland's Donna Maid	L. A. Turner, Riverlea	5 13	385.0	331	8,915.1	559.20
Selside Lady Mermaid	John Gibson, Stratford	5 320	385.0	295	8,933.5	546.14
Meon Nursia	H. J. Fourneau, Pakowhai	5 10	385.0	329	9,892.0	527.61
Taumangi Petunia's Pride	W. J. Chynoweth, Walton	5 3	385.0	349	9,438.3	523.46
Palatine's Lady Ann	A. Hazelton, Waihou	6 334	385.0	340	9,375.8	501.34
Tyntesfield Suzanne	Mrs. E. W. Garland, Matamata	5 29	385.0	360	9,023.5	468.80
Palatine's Baby	C. Hazelton, Matamata	5 342	385.0	356	9,456.9	453.50
Tyntesfield Clematis	Mrs. E. W. Garland, Matamata	5 8	385.0	365	9,276.7	416.03
Caesarea Maida	F. Parsons, Whenuakura	5 292	385.0	323	7,574.6	412.57

Friesians.

Junior Two-year-old						
Sunnybrae Wakalona Linda	A. W. Montgomerie, Mangere	1 349	275.5	318	10,386.9	488.55
Sunnybrae Wakalona Trixie	A. W. Montgomerie, Mangere	1 298	275.5	325	10,194.2	353.13
Senior Two-year-old						
Oakview Keyes Queen	A. W. Montgomerie, Mangere	2 275	303.0	348	16,419.7	565.31

Friesians (Continued).

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Oakview Keyes Trojan	A. W. Montgomerie, Mangere	3 191	331.1	365	23,753.3	905.92
Mature						
Manakau Zozo Tui 2nd	A. W. Montgomerie, Mangere	5 283	385.0	365	16,568.6	620.55
Balruddery Echo Sylvia Nancy	J. J. Stott, Maruakoa, Oamaru	5 16	385.0	282	13,837.7	453.95
Milking Shorthorn.						
Junior Two-year-old						
Haeremai Lorna's Pride	G. H. B. Lill, Willowby. Ashburton	2 34	278.9	364	9,195.6	368.69
Ayrshire.						
Two-year-old						
Ardgowan Pretty Maid	F. S. Hutchings, Ngakuru, Rotorua	2 31	278.6	365	11,908.4	500.39
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Friesians.						
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Oakview Keyes Verbelle	A. W. Montgomerie, Mangere	1 274	275.5	365	18,348.0	664.18
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Kass Goldies Promise	W. D. Dron, Nelson	2 31	253.6	305	9,407.5	591.16
Belle's Golden Pattie	W. D. Dron, Nelson	2 13	251.8	305	8,944.0	512.09
Pukatea Crystal	G. R. Bell, Waipuku	2 17	252.2	305	7,859.6	420.80
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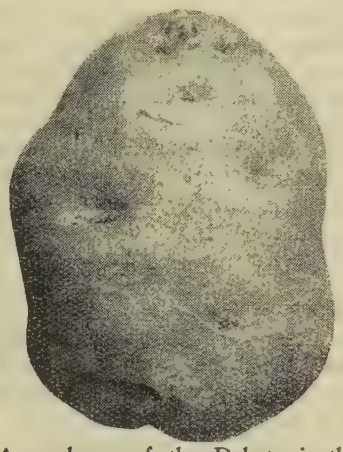
Potato Variety Trials

Crops in Ohakune-Raetihi District



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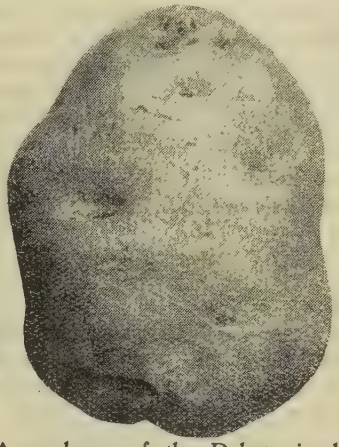

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basin located to the south-west of the National Park peaks. Part of a field that had been ploughed out of grass in preparation for a main crop of potatoes was utilised for the trials, and the preparation of the ground and subsequent inter-cultivation and general treatment of the trial plots was similar in all respects to those pertaining to recognised local practice.

Planting

The trials were planted on October 19, 1939, the "sets" being spaced 18 inches apart in the rows, with the latter 2 ft. 9 in. apart.

The fertiliser applied at the time of planting consisted of a mixture of 5 parts of superphosphate and 2 parts of sulphate of ammonia, applied at the rate of 8 cwt. per acre.

Whole "seed" was used in all instances except in two plots of the variety American Wonder, but the cutting of "sets" for the planting of these two plots did not appear to have any significant effects either upon establishment or subsequent results.

Seasonal Condition

The 1938-39 season was by no means ideal from the crop-growing point of view, and yields obtained in the trial speak well for the attributes of the soil of the district. Although climatic conditions were fairly favourable at the start of the trial, the exceptionally wet and unseasonably cold weather throughout December was not conducive to best results, and the position was further aggravated by the long, dry period which extended from mid-January onward until the conclusion of the trial. Moreover, out-of-season frosts, of which at least three were experienced during the duration of the trial, were responsible for further setbacks.

RESULTS OF TRIAL A.

In Trial A, the four varieties, American Wonder, Inverness Favourite, Iron Duke, and Majestic, were tried out in comparison with Aucklander Short Top. Seed of both South Island and local origin of the last-named variety was used. Four replications of plots of each of the above varieties were included to ensure reasonably accurate comparisons.

Although soil conditions were somewhat dry at the time of planting, the conditions for establishment were improved by rains which fell within seven days of the start of the trial. Inspection one month after planting revealed that establishment had been quite satisfactory in all varieties, with the exception of Inverness Favourite and Iron Duke, plots of which exhibited a fair percentage of "late" sets.

Progress of Plots

Plots of Aucklander Short Top, both South Island and local seed, made the quickest initial growth, closely followed by American Wonder and Majestic. At eight weeks all varieties with the exception of Iron Duke were showing strong, healthy, and fairly even growth. Plots of Iron Duke exhibited some sub-normal plants, and tuber development did not appear to be as forward with this variety or with Inverness Favourite compared with the other varieties.

Exceptionally cold and wet weather towards the end of December, followed by drought conditions beginning in

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mid-January and continuing until April, retarded growth in all varieties, and, in view of the weather generally throughout the period of the trial, the final yields of all varieties proved very satisfactory.

Order of Maturity

Plots of the variety Aucklander Short Top (both South Island and local) were the first to reach maturity, but were closely followed by Majestic and American Wonder. The varieties Inverness Favourite and especially Iron Duke were definitely later, and were still showing strong, green growth of haulm during the first week of March, when the haulms of Aucklander Short Top were completely down and those of the remaining two varieties dying off.

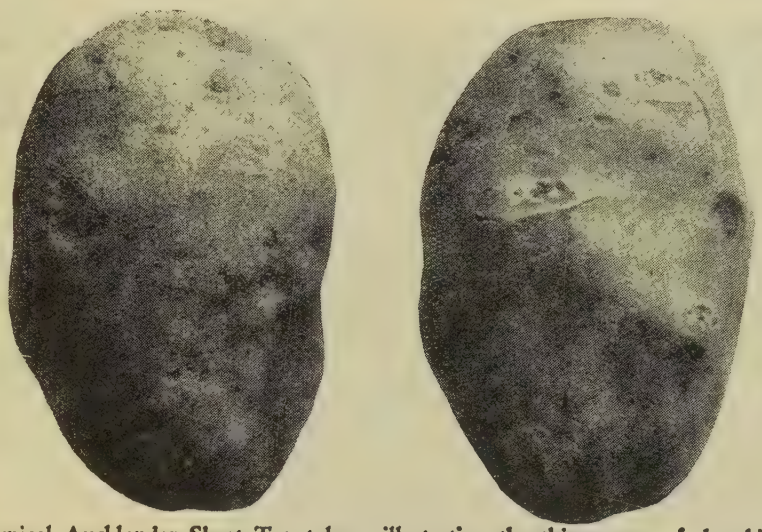
Yields

All trial plots were lifted and the produce of each weighed on April 5, 1939. The following table gives a summary of the yield figures for the trial, each figure being representative of the average of four weighings (one from each of the four plots of the one variety):—

Variety.	Yield in Tons per Acre.		
	Table	Seed	Total Marketable Produce
(1) American Wonder	7.7	1.6	9.3
(2) Aucklander Short Top (South Island)	8.6	2.2	10.8
(3) Majestic	10.7	2.5	13.2
(4) Inverness Favourite	11.1	3.7	14.8
(5) Iron Duke ..	10.3	1.9	12.2
(6) Aucklander Short Top (Local) ..	8.3	1.5	9.8

In comparing the varieties on the results obtained in this trial it will be noted that both Inverness Favourite (14.8 tons) and Majestic (13.2 tons) gave significantly higher yields per acre of saleable tubers ("table" and "seed") than the average of 10.3 tons per acre from the standard Aucklander Short Top variety. Iron Duke yielded well, but because of its slowness in reaching maturity and because of the fact that difficulty is often experienced in maintaining the standard of this variety over a period of years, any recommendation as to its suitability to the district can be made only with reservation.

The variety American Wonder, which had shown much promise in the 1937-38 season's trial, proved the lightest yielder in the trial under discussion, although its average yield was not significantly below that of the standard variety.



Typical Aucklander Short Top tubers, illustrating the thin nature of the skin and its liability to damage.

Judged on the appearance of the line of "table" tubers produced, the varieties American Wonder and Majestic were both better than Aucklander Short Top, the tubers being more evenly sized and shaped and of cleaner appearance. The remaining two varieties compared quite favourably in this respect with the standard variety, although more variation in size and shape of the tubers was noticeable in Inverness Favourite.

RESULTS OF TRIAL B.

In this trial five early and ten main crop varieties were included, 50 tubers of each variety being planted in a single row. All varieties established satisfactorily, but the rapid growth of the newly-imported Doon Early was outstanding. The rows of Cliff's Kidney and Epicure were perhaps the least even in this trial.

The observations made during the period of the trial are summarised in the following table, the early and main crop varieties, respectively, being arranged in approximate order of merit as determined from this trial.

RESULTS OF DEMONSTRATION TRIAL.

Variety	Relative Merits	Yield		Maturity	General appearance of tubers
		Table	Total marketable produce		
Earlies—					
Doon Early ..	Very good	Very good	Very good	First early	Evenly shaped, good size
Robin Adair ..	Good	Very good	Very good	Second early	Excessive proportion of small tubers
Epicure	Good	Good	Good	Second early	Evenly shaped, good size
Jersey Bennes ..	Fair	Good	Good	Second early	Many misshapen tubers
Cliff's Kidney ..	Poor	Poor	Good	Second early	Tubers very small
Main Crops—					
Majestic	Very good	Very good	Very good	Early main crop	Evenly shaped, good size
Dakota	Very good	Very good	Very good	Main crop	Evenly shaped, good size
American Wonder	Good	Good	Good	Early main crop	Evenly shaped, good size
Inverness Favourite	Good	Good	Very good	Main crop	Evenly shaped, good size
Arran Banner ..	Good	Good	Good	Early main crop	Evenly shaped, good size
Aucklander Short Top	Good	Good	Good	Early main crop	Evenly shaped, good size
Arran Chief ..	Fair	Fair	Good	Main crop	Evenly shaped, good size
Gamekeeper .. (Northern Star)	Fair	Good	Very good	Late main crop	Moderate size, many small
Maori Chief ..	Fair	Good	Very good	Late main crop	Moderate size, many small
Iron Duke	Poor	Fair	Fair	Late main crop	Many misshapen tubers

General Conclusions

The information gained from these trials cannot be taken as conclusive, as factors such as blight resistance have not been considered, while the results obtained in one season may not necessarily apply in all seasons. Nevertheless, the results suggest that the variety Majestic is worthy of the consideration of every grower, while Inverness Favourite, Dakota, and American Wonder might profitably be given a trial by potato growers in the Ohakune-Raetihi district. Certified seed of all these varieties is available.

Purely as a first early variety, Doon Early has shown very high promise, but seed supplies of this variety are not yet available commercially.

Further trials are being conducted during the coming season particularly with a view to determining the relative values of certain varieties when dug as "earlies" or as "main crops" respectively.

Review

"Cavalcade of Farming"

"Cavalcade of Farming"; published by the Point Blank Press Co. Ltd., Wellington; price 2/-.

THIS distinctive and attractive publication surveys the phenomenal agricultural and pastoral progress which has been made in New Zealand in the first century of organised settlement, and from the farming community especially should receive a warm welcome. No attempt has been made to write a formal history, but in 72 pages of letterpress and appropriate illustrations there is unfolded in well-chosen sequence a story of unprecedented successful endeavour to win wealth and prosperity from virgin lands. Tussock-covered plains, impenetrable bush and swamp and raw volcanic soils have been converted into farms of high fertility and production. Mistakes have been made, and at times optimism has outweighed judgment, but with all these admitted, New Zealand's farming achievements make a proud heritage for present and succeeding generations.

As a setting to the main theme of "Cavalcade", the publication opens with a short description of the coming of the Maori, and Maori agriculture. Due credit is given to the efforts of Samuel Marsden, the "first Pakeha farmer", and there is a brief biography of Edward Gibbon Wakefield. Then follows the main story, the history of land settlement from the earliest times up to the present.

The story is well told. The pioneers who came to this country from all parts of the British Isles were no mere adventurers. Adventure they were eager for and got it, but their primary purpose was to build a Britain of the South. To-day we live largely on their achievements. In the vicissitudes of the last century there were many hungry periods, but these were dauntlessly faced, and in times of adversity — sometimes prolonged — the building of a nation went on. Thus when good times came again, the country was in a position to reap the full benefits.

Comprehensive accounts are given of the rise of the sheep and dairy industries, each of which is given a separate section. Here again we have narratives which tell how foresight and resourcefulness overcame days of adversity and heart-breaking reverses. However, at the time one has the feeling that the indomitable spirit of the early settlers was equal to all obstacles in the path of progress.

The discovery of refrigeration, the enterprise shown on the high seas by the shipping companies which made trade between New Zealand and the Motherland possible, the establishment of English pastures, the history of the New Zealand Farmers' Union, the rise of the pig, fruit and poultry industries are adequately dealt with.

There is a section devoted to stud stock in which the history of the principal breeds of cattle and sheep and their introduction to New Zealand are outlined. Undoubtedly the first sheep brought to the Dominion were Merinos, and it is more than probable that the shorthorn was the first breed of cattle, and it is interesting to note how these original breeds have been superseded in the passage of the years.

The growth of internal as well as external transport is summarised, and "Cavalcade" closes with a chapter on land clearing by the most modern machinery, a striking contrast to the laborious methods of pre-mechanical days.

The sponsors of "Cavalcade of Farming" are to be congratulated on their enterprise. This short review cannot do justice to the wealth of detail this publication contains. It should be in the hands of all those interested in the history of their country, and is specially commended to those who are yet too young to realise the heritage and traditions which have been handed down to them.

Forcing Early Crops of Potatoes

W.H.P.R. (WAIHI):—

I wish to thank you for the bulletins which I have just received. I am very interested in potato growing, having grown them successfully as late crops for several years. However, it is my intention to try early crops.

My present problem is this—is there any way of forcing to sprout seed dug in late November to plant in late December?

FIELDS DIVISION:—

You will obtain information on the growing of early crops in an article entitled "Truck Farming at Pukekohe" in the "Journal of Agriculture" for February, March, April, and May, 1938.

Your present problem, i.e., the forcing to sprout of seed dug in November to plant in late December, you will see from the article can be solved by using the Northern Star potato.

It may be possible by using vernalisation to employ other varieties. You could try subjecting the seed as soon as it is dug in late November to the following treatment. Put the seed tubers on a raised wire-netting frame. Hang over them electric light bulbs, and place electric light bulbs below them. In this way the potatoes can be subjected to continuous illumination from the period of harvesting until the time of planting. This process has been found to make the potato sprouts grow faster.

The Akaroa Cocksfoot Crop

Principal Source of Income To Settlers For Over 60 Years

— By —

R. McGILLIVRAY, Fields Superintendent, Christchurch.

Bringing in cocksfoot for threshing.

BANKS Peninsula and cocksfoot can almost be said to be synonymous terms to many people, and especially to those of the older generation who have grown up with the development of cocksfoot in the Akaroa district. With the clearing of the forest, cocksfoot was sown sometimes pure but more often as a constituent of a pasture mixture, but in almost all cases cocksfoot soon showed dominance, and the other plants rapidly disappeared from the pasture.

Cocksfoot can be said to have been a more or less chance introduction to the district, as its value was not realised at the time of its introduction some 87 years ago. It was in 1852 that the first sowing was made at Pigeon Bay. Further sowings were made as the land was cleared of bush, and by 1865 there was quite a brisk demand for seed both for local sowing and from other parts of New Zealand. It can also be stated that Akaroa cocksfoot was one of the first farm seeds exported from the Dominion, and as time passed the name became widely known throughout this country and also overseas.

Value to Settlers

The introduction of this grass has meant much to Banks Peninsula settlers, as in the heyday of production more than 120,000 sacks of seed were consigned from the district, and for a long period from 70,000 to 80,000 sacks was looked upon as an ordinary crop. For many years all the seed except that from Little River was conveyed to Lyttelton by sea, but with the development of roading the seaborne traffic in seed has almost disappeared.

For more than 60 years the cocksfoot seed industry has been of great importance to the settlers in Banks Peninsula, and at one time was their principal source of income. Although a further decline in the amount of seed produced is likely because of the increased cost of harvesting and the introduction of dairying and sheep, it is considered that the anticipated decline may not eventuate for many years.

Of more recent times dairying and sheep have become important phases of farming in the district, and this has resulted in seed production taking a much less important place. Moreover, with the increased cost of harvesting on country of this nature, there is likely to be a still further decline in the amount of seed produced.

It is interesting to note that in the early handling of the seed crop serious difficulty arose, as those at that time interested treated it in a similar manner to the wheat crop, but in threshing it was found that much of the seed would not leave the heads, and thus growers came to the conclusion that to cut the crop and tie it in sheaves and stack was a mistake.

Method of Handling

Experience showed that under Peninsula conditions the crop should be cut and left in bundles on the stubble, and as soon as sufficiently dry should be conveyed to the threshing floor. Under this method, especially in bright, sunny weather, the seed leaves the heads readily. This then became the recognised method for handling the cocksfoot crop of the Peninsula.

It should be pointed out that because of the hilly nature of the district the crop is cut with the sickle and threshed either with a small mill or with the flail. The seed is winnowed before bagging, and in many cases an excellent sample is made in this way. It can be understood that under this harvesting method costs are relatively high, but many farmers express the opinion that even with high costs the seed crop, plus winter grazing, is still an attractive proposition in seasons of average yield. This being so, it is held in some districts that the anticipated further decline of the industry may not eventuate for many years to come.

Until comparatively recent times seed from the district was sold at its face value, and with a name like "Akaroa,"

which had become almost a household word in the seed trade and among farmers, no great difficulty was experienced in disposing of the crop, but with a view to still further safeguarding the position the Akaroa Cocksfoot Seed-growers' Association was formed in 1930. This association works in close co-operation with the Department of Agriculture in operations affecting the certification of the cocksfoot seed produced in the district.

Certification Scheme

In maintaining and developing a seed industry under present-day conditions it has been amply demonstrated that purchasers require some guarantee as to type, purity, and germination, and the Department's certification scheme has proved of distinct benefit to the cocksfoot industry, as it has enabled purchasers of the seed to feel satisfied that they are protected, for it is in their power to demand the standard of purity and germination and origin of the seed before purchase is made.

The certified seed is machine-dressed at the various seed-dressing stations, and if it proves up to the requisite standard it is finally tagged and sealed by officers of the Department of Agriculture. Purchasers of this seed know that they are buying something with a guarantee behind it, and few farmers today are at all inclined to accept uncertified seed.

Seed production on the Peninsula is definitely governed by weather conditions. For the highest yields good autumn and winter rains are essential. Growers have generally found that with a good autumn growth and the absence of unfavourable weather at flowering time a satisfactory harvest can be expected. This crop is mainly cross-fertilised, and, this being so, there is a greater demand for favourable climatic conditions at flowering time than in the case of crops that are of the self-fertilising type. In some seasons heavy gales accompanied by a high rainfall have been experienced at the flowering period, and if these conditions persist for some days the ultimate yield is generally seriously affected.

There is practically no cultivation on Banks Peninsula, and all types of farming can be designated pastoral, as the farmers have all their properties under pasture, and the dominance of cocksfoot in most districts is the outstanding feature. Some of these pastures were sown approximately 80 years ago and are still in production, whether it be under dairying, fattening, or seed.

Riddling the seed on the farm before bagging.

Grazing

The grazing of the seed-producing areas during the winter can be carried out successfully and without detriment to the following seed crop as long as the grazing is light and with cows or young stock. The areas should not be grazed with sheep except, perhaps, for a short period in the early autumn, but sheep should definitely be removed before the usual late autumn growth sets in, as they tend to eat out this growth. The safe grazing period for cows or young cattle can be considered as from May until the end of July. Stocking with cattle at this time does much good in tramping down the dead growth, which forms a mulch around the roots of the plants and tends to hold the moisture and keep the soil cool during the heat of the summer.

In conclusion, it can be said that the cocksfoot seed industry has for more than 60 years been of great importance to the settlers, and at one time was their principal source of income. The district is very different climatically from the Plains. The rainfall is much better, and the influence of the sea is noticeable in the milder winter climate. On the more sheltered portions there is seldom a cessation of growth, and investigations made in June and July have shown appreciable growth.

It is these conditions, plus a fertile soil, that have enabled the seed industry to be conducted in this manner over a long period.

Eradicating Rat-tail Grass

"RAT-TAIL" (HAMILTON):—

Will you kindly advise me through the "Journal" what is the best method of eradicating "rat-tail" grass from pastures? It is mainly confined to sidlings, which are ploughable.

FIELDS DIVISION:—

Where land can be ploughed, no difficulty should be experienced in eradicating rat-tail. The most successful method is to plough the land during January, roll if possible, and leave fallow until end of February or prior to working the land for early March sowing. Care should be taken not to disturb the furrow by having too much set on the discs; the lighter the discing the better.

The whole success of eradication depends on how well the land is ploughed; bad ploughing means an invasion of the pest after a few seasons. Liberal seeding and fertilising is essential for a quick pasture sward establishment, which will completely choke any young rat-tail growth.

There is no known method of eradicating rat-tail in pastures where land is unploughable. The pest can be held partly in check by introducing better pasture species, liberal fertilising, and avoiding severe winter and spring grazing.

A crop of Montgomery red clover in Southland closed for seed.
[H. Drake, Photo.

Small Production of Ryegrass Seed In Southland

Other Varieties Which Should Yield Profitable Returns

A. STUART, Instructor in Agriculture, Invercargill.

SOME eleven years have elapsed since the introduction of certification to lines of perennial ryegrass in Southland, and since that time there has been a decided falling-off in ryegrass seed production in this province.

This did not occur because of any local prejudice in growing lines which originated in other districts or because of the high prices which these lines commanded; the real reason was that the germination of certified lines of seed could not be depended on when produced in this locality. Consequently, the risk of failure was too great, as one fortunate season could not be expected to compensate for three unfortunate seasons, even after taking into consideration the high yields obtained.

An article entitled "Blind-Seed Diseases in Ryegrass" in the "Journal of Agriculture" for March, 1939, p. 223, discusses what is known concerning low germination and the avenue being explored by research workers in an endeavour to combat what is a serious problem to the seed producer.

Until the problem of germination of perennial ryegrass is solved, the sowing of ryegrass for seed production is not likely to be an attractive proposition for many Southland farmers. However, there are other varieties of grasses and clovers which should yield profitable returns in this province, and this article sets out several points which will assist farmers who may be contemplating entering the seed trade.

The following figures show the acreage of perennial ryegrass cut for seed and yield per acre:—

Season.	Acres.	Yield (lb.)
1924-25	15,651	480.52
1925-26	14,471	530.22
1926-27	15,592	434.54
1927-28	8,855	516.38
1928-29	9,967	464.34
1929-30	9,937	489.85
1930-31	13,354	407.35
1931-32	6,143	404.92
1932-33	11,629	479.94
1933-34	10,450	446.14
1934-35	10,479	413.41
1935-36	10,636	512.41
1936-37	4,661	368.57
1937-38	5,299	365.14

Decrease in Area

From these figures it will be noticed that a decrease in area took place from the season 1926-27, although the very low acreage seen 10 years later in 1936-37 can be accounted for by the wet season experienced, which precluded the cutting of many areas which had been closed for seed production. In Southland, with its comparatively short grass-growing season, the rush of surplus growth in late spring is accentuated, and in addition to the closing of areas for hay and ensilage, the closing

of seed production areas relieved the position to some extent.

Until such time as the germination trouble on perennial ryegrass has been solved the seed producer is being forced to explore other avenues of seed production, and in addition to timothy, *Lotus major*, crested dogstail, and browntop, which have been harvested for many years in Southland, it is found that certified lines of white clover, cocksfoot, Italian ryegrass, and even Montgomery red clover are being used for this purpose. It should be noted that Chewings fescue is confined to certain districts, which practically have a monopoly of this seed to the exclusion of all other seeds.

As the crops mentioned are comparatively new to many growers, advice and experience already gained may not be out of place to intending growers.

In the first place, it is necessary that only seed of mother seed standard, or better, be sown. Pedigree lines which are of higher standard than mother are obtainable in white clover and cocksfoot. In selecting lines, those with the least impurity should be preferred.

White Clover

White clover mother seed at 3lb. per acre would generally be sown with a mixture of grass seeds, as not every season would be suitable for the production of seed. Sown in this way, hay or ensilage would be obtained if the seed crop were unprofitable.

In a wet season it is found that white clover growth continues right into the autumn, and the seed heads formed in January rot and fall to the ground. The later flowering heads do not have time to mature, and consequently the crop is not payable. The 1937-38 season was exceptionally favourable for the production of white clover seed, and yields of more than 200lb. per acre were obtained in many cases.

One precaution to be taken is not to sow white clover on land on which *Lotus major* has been previously grown, as this clover proves to be a serious seed impurity which cannot be eliminated by machine dressing. Another serious impurity in white clover which is very hard to eliminate by machine dressing is the annual suckling clover, or little trefoil. If, however, the land is well drained and in good heart and the seed bed is fine and firm, it will be found that this clover tends to be smothered out by the white clover.

Cocksfoot

Cocksfoot is generally sown pure at the rate of 20lb. per acre where the farmer is prepared not to graze the field throughout the year. Where a little grazing is to be secured, however, 2lb. of white clover could be profitably included. Grazing should be strictly controlled, and the crown of the plant should not be severely grazed. The farmer should act on the principle of a large number of stock for a short period, rather than on a smaller number for a longer period, when perhaps serious damage may occur in certain parts of the field.

In selecting lines of seed to sow, care should be taken to select those lines showing the least ryegrass impurity, as it is practically impossible to obtain the necessary purity standard with ryegrass present in any quantity. Cases

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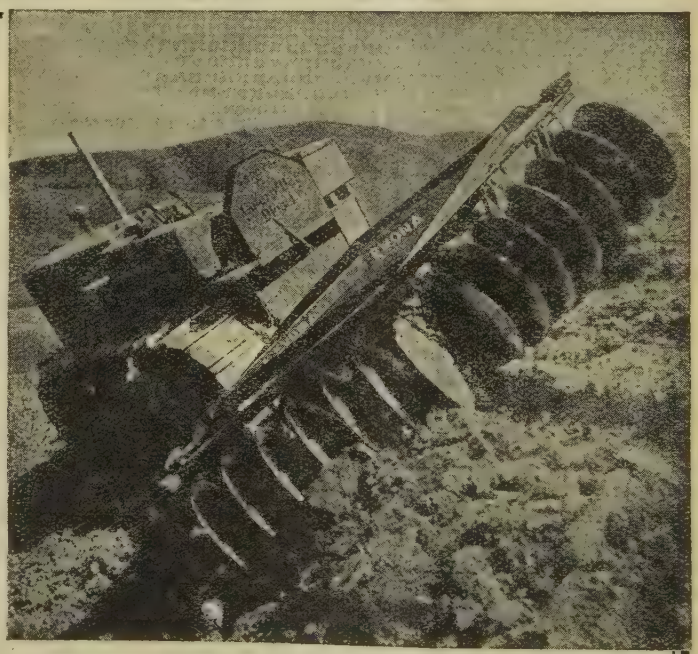

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have occurred where farmers have obtained a dominant ryegrass sward in the first year after a pure sowing of 20lb. per acre of cocksfoot. This quantity of seed, however, contained nearly 1lb. of ryegrass, and when it is realised that 1lb. of ryegrass contains 250,000 seeds (a seeding of nearly six to the square foot) this is readily explained when the differences in rate of establishment are also taken into account.

If, in spite of all precautions, ryegrass shows to any extent the area should be made into hay to prevent any ryegrass seed falling. If continued for a few seasons this treatment will, even in bad cases, eventually result in the elimination of the ryegrass, which is generally of the false perennial type. Land sown to cocksfoot should be well drained and, if possible, with a gravel subsoil. River banks are ideal for this purpose.

The yield of cocksfoot has a habit of varying from season to season. As high as six bags per acre have been obtained, but the average would be below three.

Italian Ryegrass

Italian ryegrass is generally sown pure at the rate of 25 to 30lb. per acre in the autumn after oats. Feed is obtained during the last autumn, winter, and early spring, and the area is closed for seed production about the middle of October. It is ready to harvest in January, coming in after perennial ryegrass. Forty bushels per acre of seed can be expected under average conditions.

The Department apologises for the late publication of the "Journal" this month, which has been caused by difficulties in obtaining supplies of paper, due to the war. It is expected that normal supplies will be on hand for next month's issue.

Montgomery Red Clover

For seed production Montgomery red clover will never become popular with the Southland farmer, as the harvesting of the crop even in a favourable season would not be before the end of April. Weather conditions at this period cannot be relied on, and consequently the element of risk is too great. In late years, however, a number of crops have been harvested, but in most cases the areas have not been as pure sowings, the general procedure being to include 2 to 3lb. of Montgomery red clover in the permanent seeds mixture. The area is grazed to the middle of November and then closed to stock.

With ordinary conditions, the crop is ready to cut in April. If sown pure, 8 to 10lb. of seed would be necessary, sown with 10lb. of either perennial or Italian ryegrass (as may be preferred), which is included for the purpose of holding the clover up to some extent and encouraging easier cutting.

It is often found that a very heavy seed crop lodges and rots to some extent before harvesting can be carried out. This may result in an opening up of the sward. In all cases, the Montgomery red clover would be spring sown, and generally sown with a nurse crop of oats. A yield of up to 200lb. per acre could be expected.

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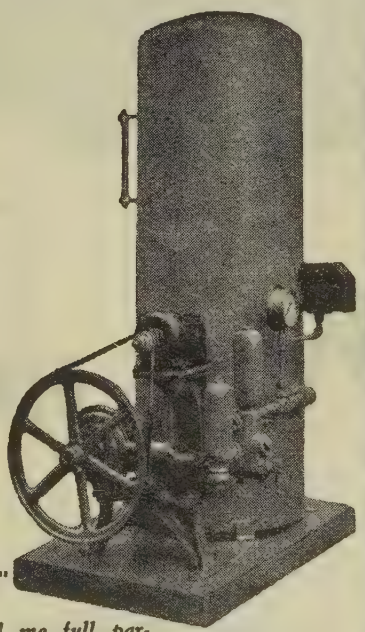

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Pasture Improvement by Crop Rotation On West Coast Farms

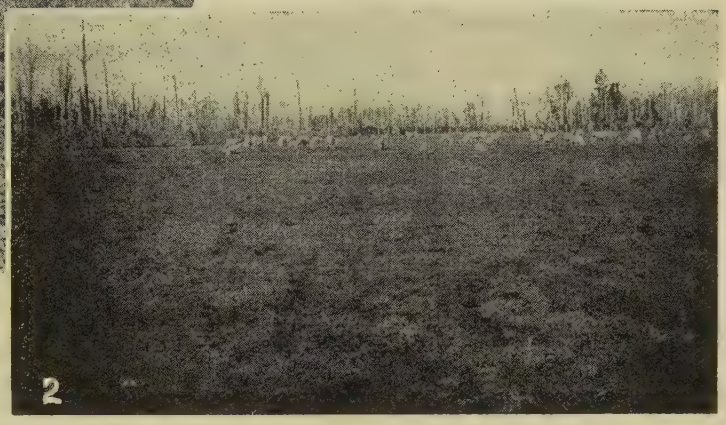

Fig. 1.—This half of the paddock was ploughed once after clearing and then sown down to grass. *Fig. 2.*—The other half of the same paddock, which was ploughed twice before sowing down, the first ploughing being for turnips.

Pressing Need for Introduction Of Ordered Routine

A. D. MERCER, Fields Instructor, Greymouth.

Crop rotation as a means of pasture improvement on West Coast (South Island) farms is discussed by the author, who considers that there is a pressing need in that area for the introduction of an ordered routine into farming practice. A suggested scheme is described, although it is emphasised that the plan must be modified to meet individual requirements and conditions.

ONE of the most pressing needs on West Coast (South Island) farms today is the introduction of some system into farming practice. The haphazard methods of the past are proving inadequate to present-day conditions, and the successful farmer is the one who works year by year to a definite, ordered routine.

In older countries a system of crop rotations has been evolved, varying from district to district according to local requirements and conditions of soil and climate. These rotations are the result of centuries of experience, and any departure from them is not lightly undertaken.

The general attitude is well expressed by A. G. Street in "Farmers' Glory," referring to the Wiltshire four-course:—"This rotation was as unalterable as the laws of the Medes and Persians. One always knew what crop a particular field would be growing two or three years ahead, and worked to that end. Any slight variation was considered a sin, and like sin, it always left its mark. For instance, if one were tempted to harvest for seed a piece of vetches or clover, the extra robbing of the ground showed in the ensuing wheat crop. It mattered not a whit that the produce of this immoral seeding might bring in more money than a good crop of wheat. One didn't farm for cash profits, but did one's duty by the land."

To advocate neglect of cash considerations to West Coast farmers would be, of course, quite impracticable, but there should be a more general realisation of the eventual monetary benefit to be derived from farming in accordance with the principles of good husbandry.

Advantages of Rotation

The advantages of a definite rotation may be stated as follows:—

(1) Healthier and more vigorous crops. Repeated growing of one crop leads to loss of vigour and insect and fungous disease.

(2) Distribution of labour over the year in cultivating and sowing.

(3) Economy of soil fertility. Different crops make varying demands on the essential plant foods. Some plants are deep rooted; others are shallow and draw their requirements from different depths of soil.

(4) Leguminous crops, such as clovers, tares, and lupins, restore fertil-

ity by adding to the nitrogen content of the soil.

(5) A variety of feed is available for stock at all seasons of the year.

(6) The growing of root crops enables the land to be cleared of weeds periodically, while certain catch crops help to smother them.

The high rainfall experienced on the West Coast renders the district quite unfitted for the adoption on a large scale of arable farming. It is essentially a grassland country, but it is most important to realise that the plough is the foundation of good permanent pasture. Topdressing with lime and phosphates has brought about wonderful improvements on inferior pastures, but large areas are carrying such a poor sward that it is doubtful whether it is an economic proposition to topdress until good grasses which will respond to treatment in such a way as to give a profitable return on the money invested in lime and phosphates can be introduced.

There is a prejudice in some quarters against ploughing up and re-sowing, due chiefly to the failure in some cases to obtain a good "take" of grasses on newly-ploughed land.

Permanent Pasture

It should be obvious that good grass establishment could never be expected under such conditions. When virgin country is turned over for the first time and the ploughing, because of the nature of the country, is generally rather a rough job, a good "take" of grass is hardly to be expected by following this up with two cuts with the discs and then sowing down. Permanent pastures is the most important crop on the farm, and grass seed needs the cleanest, finest, and best-worked seed bed of all. One ploughing and a stroke with the discs is, as a general rule, a totally inadequate preparation.

The accompanying illustrations demonstrate this clearly. The whole paddock was ploughed, cultivated, and sown at the same time, but the half shown in Fig. 1 (now disfigured and reduced in carrying capacity by a dense growth of rushes) had only the one ploughing. The other half, shown in Fig. 2, and carrying a clean, dense sward, had also been ploughed and cultivated the previous year for turnips. The benefit of the extra cultivation is most outstanding.

Best Preparation

As a thorough working of the ground over a period of several years is the best preparation for successful establishment of first-class pasture, it becomes necessary to consider what crop should occupy the ground over that period. A sound farming principle is that more feed can be produced on an acre of arable land than on an acre of grassland, enabling more stock to be carried, so that although in this district climatic and labour conditions render any large-scale adoption of arable farming impracticable, the farmer who can bring only a small area under the plough at one time is increasing his stock carrying capacity and at the same time bringing his land into a fit condition for sowing to a good permanent pasture.

In the first year the area decided on might be ploughed in the summer and worked down for autumn-sown oats and tares. On old run-out pasture, provided it were clear and level enough, it would be an added advantage if the paddock could be skim ploughed first to a depth of 1in. and worked with the discs before ploughing. To have the surface partially worked before turning it under is very much better farming practice than to plough in a thick impervious mat of old grass roots, weeds, and moss. An autumn-sown crop of two bushels of oats and one bushel of tares should provide a great bulk of feed in the spring either for feeding off or for ensilage.

Four Crops

As soon as this crop is off the ground could be prepared for rape or turnips to provide autumn feed, sowing at the same time a seed mixture of Italian ryegrass and red clover to be left down for two years, and providing a good crop for hay and grazing. After the second hay cut or spring grazing the area should be ploughed and well worked through the summer preparatory to sowing with a permanent grass seed mixture in the autumn on a fine, well-consolidated seed bed. It is not necessary to sow with a so-called nurse crop; in fact, in a grassland district such as this the cereal nurse crop is definitely undesirable, and in many cases is responsible for a high percentage of weeds in the young pasture.

Thus, in a period of three years the land has produced four crops if silage and hay are made, in addition to the aftermath grazing. Two objectives have been attained—increase of the stock carrying capacity of the farm, and favourable soil conditions for the establishment of a high-producing permanent pasture. Some such system as this can be applied to large or small areas, to one paddock at a time, or to three simultaneously, in which case they would each be at a different stage of the rotation in any given year. The rotation suggested is not necessarily the final word on the matter. It is put forward as a tentative plan open to modification and improvement according to individual requirements.

Important Point

The important point is that each farmer should decide for himself the acreage of arable ground that he can handle each year, bearing in mind the fact that it is better to do 10 acres thoroughly than to attempt 15 or 20 and scamp the job. A simple course of cropping must be decided on and developed into an ordered routine which will meet individual requirements in stock feed, prepare the land for permanent pasture, and be in accord with the principles of good husbandry.

A further article will deal with manuring and seeding.

Potato Crop Suffers from Grass Grub

On a light loam soil at Belfast a potato crop suffered severely from grass grub injury last season. The farmer in question rejected nearly 20 per cent. of his crop as pig potatoes on account of the damage done. Odd roots dug showed that a large number of these grubs were present in the soil, while on examination the pitted surfaces of affected tubers revealed the presence of grass grubs in the eaten-out cavities. Further evidence in support of the damage being due to grass-grub attack was obtained when some of these grubs were put in a tin containing potatoes. Some time later freshly-eaten patches on the surfaces of these tubers could be plainly seen.

Pampas Grass in the King Country

Practical Experiences of Value As Supplementary Winter Fodder

J. M. HOPKINS, Instructor in Agriculture, Taumarunui.

THE past winter in the southern portion of the King Country has been very severe, and cattle especially have suffered through shortage of winter fodder. Although the weather conditions were mild until well into the winter months, the exceptional dry spell in the autumn caused most of the pastures to be well eaten out, and they did not recover sufficiently to ensure adequate winter grazing for cattle.

Ailments in cattle, especially dairy cattle, have been exceptional this spring, and no doubt many of these troubles were directly caused by a weak and starving condition due to insufficient feeding.

The experiences of two farmers in the southern King Country give further proof of the value of pampas grass as a supplementary winter fodder for cattle. If production is to increase and this country is to be maintained in grass, large numbers of cattle are necessary, and their feeding in the short period of the year is all-important.

In the ordinary course of events only limited amounts of root and hay crops can be grown because of the small percentage of ploughable and easy country. As such crops cannot be grown in large enough quantities to winter sufficient cattle—and cattle are necessary on all of this hill country—something more is needed to tide stock over the worst months of the year.

There is no doubt that pampas grass will fill that want. In the past a great deal has been written about pampas grass as a supplementary winter fodder, and it is felt that a further plea for its extended use will not be out of place.

Established Plantation

Of the established plantations in the district, several have been fed off for the first time this winter, and the results have more than repaid the outlay in setting up the areas. Two of these plantations are worth quoting. They are owned by Mr. M. W. Coates, of Aukopae, and Mr. W. H. Fife, of Niho Niho.

The first has an area of approximately quarter of an acre. Feeding was begun on July 23 with 35 calves and eight cows, and access to the feed was allowed for two hours each day. This was continued for two weeks, and the stronger calves and some of the

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cows were removed. Up to the end of August the number of stock having access to the plantation was 30 calves and three cows, and it was estimated that two to three weeks' feeding was left on the bushes. Hay was also fed each day to the cows and calves, and at the end of August they were in a very strong and healthy condition.

Although this plantation is small, it can be seen that it has served a valuable purpose, and Mr. Coates intends to establish other areas this spring.

Mr. W. H. Fife is very enthusiastic about the value of pampas grass, and altogether he has approximately four acres of the grass well established. At the end of August two plantations, one three and one four years old, and each of one and a half acres, were being fed off with 50 bullocks, and a one-year-old plantation of one acre had already been fed off with 21 calves. The latter plantation should not have been fed off until fully grown, but shortage of feed compelled Mr. Fife to give the calves access to it, and he considers that many of the calves would have died were it not for the pampas grass. Mr. Fife is preparing the site for another plantation, and his method of establishing pampas grass is worthy of note.

Time for Planting

Seedlings are planted in the spring in a cultivated nursery bed, and are left there for one year. The following spring all foliage is removed from the plants to within one foot of the butt, and the plants are lifted and set out in the permanent area, which has been prepared beforehand. Preparation of the plantation site consists of clearing secondary growth, spitting the holes for the plants, and fencing the area.

The best time of the year to establish pampas grass is in the spring, when the danger of heavy frosts is over. Seedlings may be obtained for 35s per 1000, plus freight, and may be planted directly in the permanent site or in a nursery bed. Both methods are successful, but much depends on how the plantation is looked after once it is established. For the first year, at least, all secondary growth and grass must be kept away from the plants. Once on a sound footing, pampas grass requires little attention, and, except for fencing, is not costly to establish.

The Department of Agriculture has planted eight acres of pampas grass on steep, unploughable country on Mr. F. J. Fougere's property at Tatu. This plantation was one year old in October of this year. On this type of country, which is of the poorest, it will probably take four years to reach the feeding stage, but if the grass can be grown successfully on this class of land it can be grown almost anywhere. Inspections of this plantation reveal a fairly high percentage of strike in the plants (approximately 90 per cent.), necessitating little in the way of replacement of dead plants.

Conclusion

It is stated that more interest is being taken in pampas grass in the district by the actual experience of individual farmers, and it is hoped that this will tend to inspire many to take the necessary steps to establish areas of this grass. If production is to increase and the country in question is to be maintained in grass it is necessary to have large numbers of cattle, and their feeding in the short periods of the year is an all-important matter.

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Veterinary Notes for the Farmer

Discussions on First-Aid Measures

Contributed by the Livestock Division

Precautions Necessary in Dipping To Prevent Mortalities

CERTAIN details in the important operation of dipping must be observed if mortalities and loss are to be avoided. The sheep is a susceptible subject to pneumonia and pleurisy if any of the dipping fluid is aspirated into the lungs or if the weather at the time of dipping is not suitable.

The work of dipping a flock is a most important part of good flock management, for clean sheep, which are free from lice and ticks, thrive better and are more contented, and the wool will bring a better price if it is free from tick-staining. There should be no risk of mortality if certain well-known rules are followed in detail.

Making Up the Fluid

The dipping fluid should be made up in accordance with the instructions laid down by the makers of the particular dip being used. All details as to the immersion of the sheep should be carried out to ensure the eradication of lice and ticks. If good results are to be obtained it is necessary for the sheep to be wet right to the skin, and the head must be immersed once or twice during the swim. The sheep require to be in the bath about one minute for thorough wetting, and the time can be gauged by the amount of fleece and the degree of parasitic infestation present. If the sheep are seriously infested with parasites a second dipping in about three weeks is necessary, as some eggs may have escaped the first bath and may later hatch out.

Accuracy Essential

To ensure accuracy in making up the dip according to the instructions, it is necessary to know the capacity of the dip. The dip should be thoroughly cleaned out before filling with water, all sludge and dirt being removed. The capacity should be measured accurately, and the correct amount of the concentrate dip added.

If a powder dip is being used the amount should be weighed accurately and made into a paste before being added to the water. Whether a fluid, powder or paste dip is being used, thorough mixing by stirring the bath is necessary to ensure that the dip is of the correct strength throughout. If this is not done some of the lighter ingredients of the dip may be concentrated on the surface, and some of the heavier ingredients may fall to the bottom of the dip.

Repeated stirring and plunging is necessary if any delay takes place during the day's operations, and a periodic use of the plunger will prevent much of the powder from settling in the bottom of the dip.

Soft Water Best

Soft water, such as rain water, should be used if possible, as better mixing takes place. If hard water must be used it is necessary to counteract the hardness by the addition of 3 or 4lb of washing soda per 100 gallons of water in the dip.

With the soft water in a clean dip, the quantity correctly measured, the exact amount of concentrate dip added, and the whole thoroughly stirred and prepared in advance, all that is necessary before dipping begins on the following morning is the free use of the plunger from one end of the bath to the other to ensure the suspension of the active dipping ingredients.

Preparing the Sheep

As for the sheep, certain precautions are also necessary. The sheep should be thoroughly rested immediately before dipping, and should have free access to water. Heated or driven sheep will be seriously affected by dipping, and, even in the absence of a cold night or adverse weather setting in, are much more subject to pleurisy or pneumonia. Dirty or daggy sheep should be cleaned up to prevent fouling of the bath and reducing the effectiveness of the dip.

The dipping should be carefully supervised, and each animal allowed to breathe after its first immersion before the crutch is used to immerse the head again. A rest in the draining pen is necessary to remove all surplus dip from the fleece and to enable the animal to recover from the shock of the immersion. Biting dogs should not be used in the mustering and yarding, as there is a danger of absorption of poison through the broken bite wounds.

In regard to the weather, a good day should be selected, and the dipping of rested sheep should be started early. Dipping operations should cease early in the afternoon to enable the last sheep put through to dry out as much as possible before nightfall.

Dipping of Rams

Extra care is necessary in the dipping of rams. These animals are generally dipped early, as, with the approach of the breeding season, there is a greater risk of mortality taking place. In the case of very fat or valuable stud rams, spraying or careful

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hand immersion may be followed in order to avoid any risk of loss.

Dipping is such a necessary and important part of sheep farming in order to eradicate and prevent parasitic infestation of the sheep that these notes would convey a wrong impression if dipping were considered a dangerous cause of mortality. With reasonable attention to detail, as suggested, no owner should suffer losses of sheep following dipping.

Combating the Sheep Blow-fly

REPORTS have been received that lambs have been found affected with maggots as a result of strike by the sheep blow-fly or maggot-fly. Although several flies are blamed, the small yellow-brown hairy species, and less commonly the bronze-green species, are mainly responsible. The blue bottles and the striped field flies do not blow living sheep.

Weak, backward lambs which have been scouring appear to be more susceptible to the fly. Scouring, daggy lambs are likely to have the region of the breech badly stained with urine and urine stain, and the results of skin irritation from the stain, appear to be very attractive to the egg-laying fly. A single fly may deposit as many as 1000 eggs in a single day, so that a very small number of flies may do a large amount of damage.

Prevention

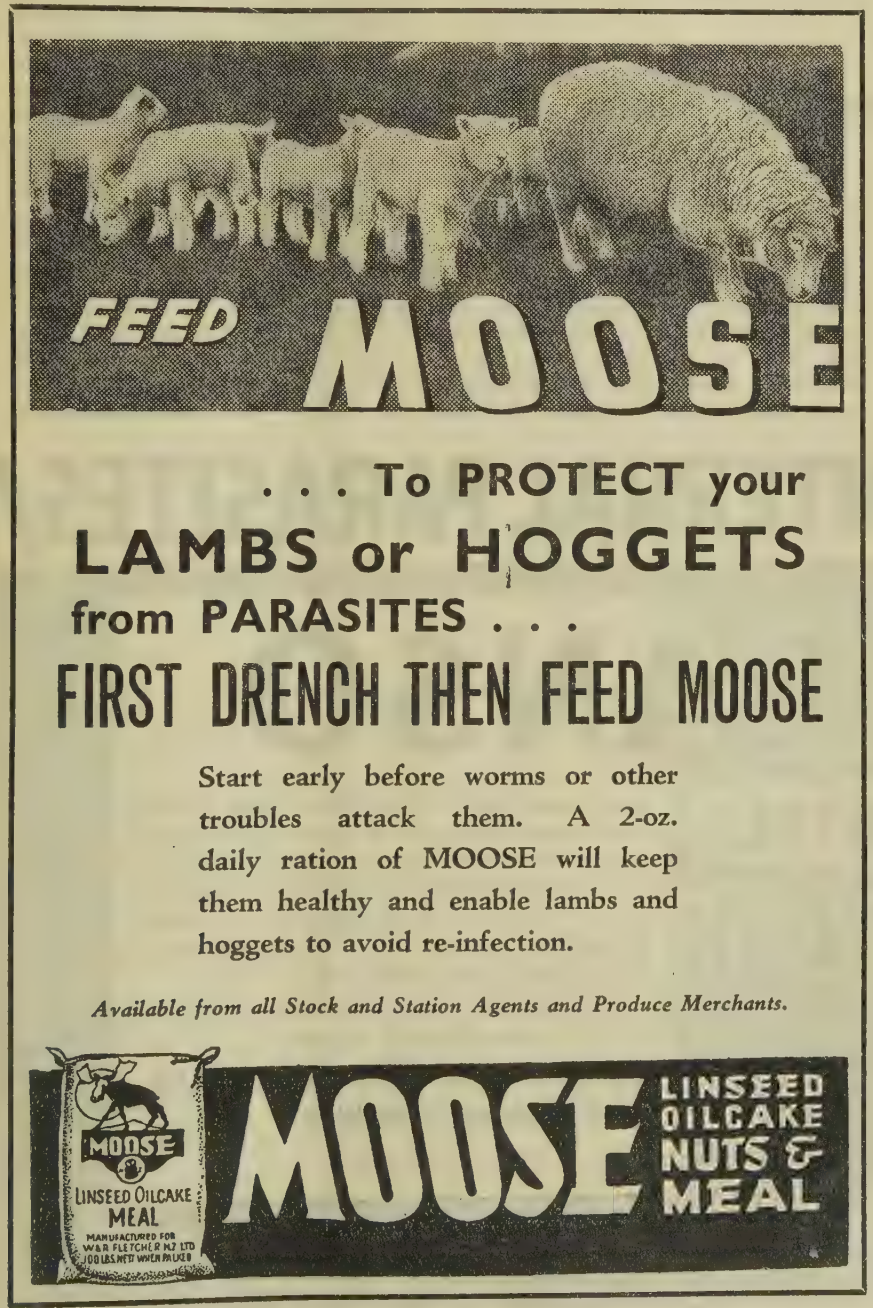
Precautions consist mainly of the prevention of the conditions which are attractive to the egg-laying flies. Dagginess in lambs, therefore, requires to be attended to by an early crutching in late December or early January, or at any time when the fly is active. The dagginess may result from a change in the feed in wet weather, or later on may result from scours due to worms in the lambs.

In any case, the cleaning up of the lambs and hoggets will do a very great service in controlling the conditions which attract the fly, and which result in the common breech strike so often seen in lambs. Body strike and back strike in areas where they are prevalent are more difficult to control, and are probably best dealt with by using an arsenical spray.

Treatment

In the treatment of affected lambs, the wool should be shorn around the "struck" area, and all maggots must be killed and removed. A good, but rather expensive, dressing for the wounds may be prepared by heating 3lb of boric acid in one gallon of pure glycerine, stirring until the mixture is clear. To this may be added one quart of ethyl alcohol, which dilutes the glyceroborate, improves the lotion, and cheapens its preparation. This preparation is effective in killing the maggots, is non-irritant, assists the healing of the wound, and has a protective value for some time afterwards.

Cheaper dressings may be used, such as a 5 per cent. solution of zinc sulphate in water, or 4 per cent. phenol crystals in whale oil. A 2 per cent. solution of liquid carbolic sheep dip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or similar disinfectant material is effective in driving out maggots and in sterilising the wounds, but it is best to follow up with an oily dressing.

A change of paddock may sometimes lessen the amount of strike, as owners frequently state that the fly appears to be more active in certain shady paddocks or paddocks with steep faces and gullies.

Disposal of Carcasses

Needless to say, all dead animals should be burned or deeply buried. If the carcass is not buried deeply the maggots will escape. If it is impossible to burn or bury, it might be possible to saturate the carcass thoroughly with an arsenical solution to poison the maggots as they hatch out and feed. To reduce the breeding ground of the fly is, and always will be, the most efficacious measure against blow-flies.

Care in Drenching Sheep

NOW that the season for drenching sheep is at its height, it appears opportune to draw the attention of owners to the need for care in the handling and drenching of sheep. It is an easy matter to force the drench into an animal, but if this is done some of the drench may easily pass down the windpipe and set up pneumonia.

If the sheep are allowed to pass quietly through the race and the drench is carefully and slowly given with the sheep standing on all four legs, with the head not raised too high. no difficulty should be experienced.

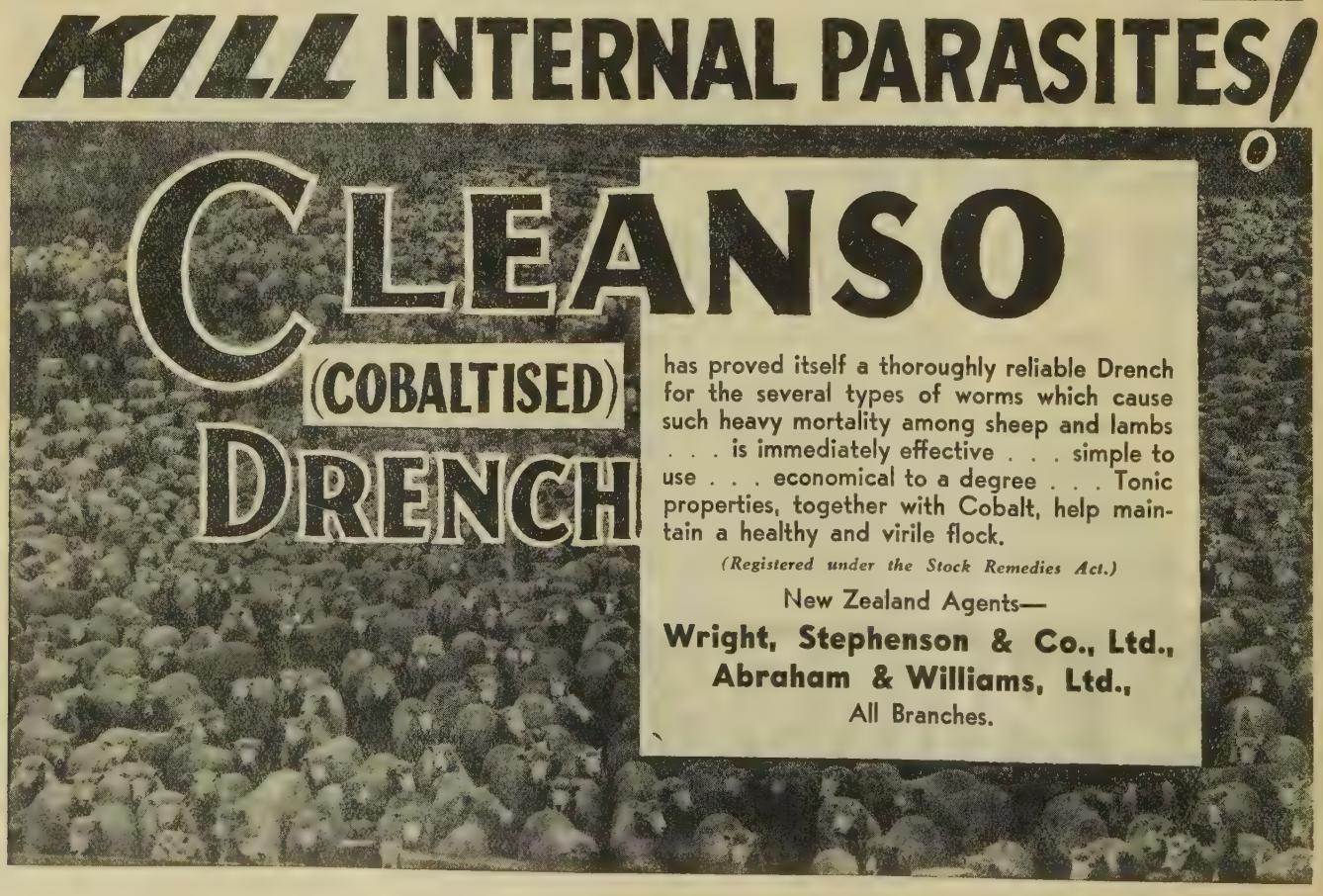
Injury to Mouth

Apart from pneumonia, there is a possibility of injury to the mouth of the sheep by the forceful use of a drenching measure or by the nozzle of a drenching gun. In past years cases of such injury have been reported by owners, more particularly following the use of a drenching gun. The injury may not become apparent for some little time after the drenching has been carried out, and the drenching gun or method of drenching is not suspected as the cause of the trouble.

In such cases a careful examination of the mouth may show an ulcer of the cheek or gum where the injury has taken place. Later, an abscess of the gum, jaw, or cheek is seen, and the animal is unable to feed and loses condition rapidly. The abscess may burst externally, in which case recovery takes place, but on the other hand, the pus may burrow into a tooth cavity or a septicaemia may be set up, which results in death. In any case, these injuries inside the mouth are so difficult to treat that every effort should be made to avoid them.

Careless Use of Drenching Gun

In the majority of cases investigated in past seasons the careless use of the drenching gun nozzle was responsible. The use of a drenching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gun facilitates the dosing of a large number of lambs or hoggets, and simply because it increases the speed of the operation there may be a tendency to carelessness in its use. Frequently the nozzle becomes roughened against the teeth of the sheep, and unless care is used to see that the nozzle is not pressed against the cheek it is an easy matter to puncture the thin lining of the mouth.

The nozzle should rest on the tongue, and the dose is delivered at the back of the tongue. If the lining of the cheek is punctured and any of the drenching fluid gains entrance, it is impossible to prevent abscess formation, as many of the drenches contain irritants such as bluestone.

Rubber Tubing

A roughened nozzle may be protected by the use of a piece of rubber tubing.

In the drenching of hoggets and sheep it is important to see that the ingredients of the medicine are in the correct amount according to the quantity of water used, and that the dosage is according to the age and condition of the animals to be drenched.

Answers to Correspondents

Leg-lice in Sheep

NOVIS (TE KUITI):—

Would you kindly give us (through your "Journal") some information on what is termed "leg-lice" in sheep?

LIVESTOCK DIVISION:—

A species of louse on sheep which is not frequently seen, and on account of this is often not recognised by farmers, is one affecting the hairy portion of the leg and known under the name of *Haematopinus pedalis*.

The parasite infests both the fore and hind limbs, but more frequently is seen on the hind legs. It is a blood-sucker, and lays a large number of eggs, which remain attached to the hair, giving the affected part a distinct brown appearance. The parasite first made its appearance, so far as is known, in the Banks Peninsula district. Since then it has appeared in various parts of the North Island, and also in the Nelson district.

The hind legs and even the scrotum of the ram may be covered with a dense mass of lice and eggs.

The leg-louse can be readily detected at shearing or crutching time. Ordinary dipping methods are effectual in dealing with the vermin, and as clean sheep may become infested by contact with affected animals, immediate precautions should be taken to safeguard the flock directly its presence has been detected.

Advisory Service on Veterinary Matters.

Farmers are invited to submit inquiries connected with the health of their stock, and the replies will be published under this heading.

Droppings in Water Trough

A.J.M. (OXFORD):—

I would be very grateful if you would please give me your advice through your "Journal" on the two following questions:—

(1) We have here a number of paddocks watered by troughs fed from a tank and well. Occasionally sheep droppings are deposited in the troughs or are blown in by the wind. If these droppings contained the larvae of any parasitic worms I think that these troughs would probably act as perfect incubators. Is there any disinfectant that would keep the water in good condition without harm to stock?

(2) What is the most reliable remedy for tutu poisoning in sheep?

LIVESTOCK DIVISION:—

The accidental contamination of a water trough by the droppings of sheep is not likely to prove a serious source of trouble in regard to the propagation of parasites. It is true that if worm eggs were deposited with the droppings in the water it is possible that larvae may hatch out, but whether the larvae would be able to pass through the various stages until they reach the infective stage is very debatable. The risk, if any, is a very small one, and it is more advisable to take this risk than to add any disinfectant to the water supply.

Naturally, one would prefer raising the troughs, if possible, to prevent the contamination by the droppings in the first place.

Troughs are considered to be a very safe method of providing a wholesome water supply free from egg and larval parasitic contamination. The real source of danger in the propagation of parasitic larvae and worms is, firstly, contaminated or infected pastures containing larvae developed to the infective stage, or a surface pond which frequently contains large numbers of infective larvae washed from the herbage by the surface water. By comparison the trough water supply is safe.

In regard to tutu poisoning of sheep, there is no specific remedy. The active principle of tutu-tutin acts on the central nervous system, causing convulsions and paralysis. There is a marked tendency to gas formation and accumulation in the paunch, and, to ease this, doses of baking soda of one ounce dissolved in a few ounces of water, doses of four to six ounces of lime water, or a dose of one ounce of aromatic spirit of ammonia in water may be given. The baking soda may be most easily obtained in an emergency. The paunch may be punctured by a suitable small trocar and cannula to relieve the gas.

Bleeding from an ear vein has also been recommended. Affected animals should be kept as quiet as possible during a convulsion.

The main danger appears to arise in the case of travelling hungry stock, so that provision requires to be made in anticipation of cases which mainly follow mustering or droving.

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FOR THE TREATMENT OF WORMS IN SHEEP AND LAMBS.
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Farm Practice and Management

Contributed by Officers of the Fields Division

Escallonia As A Shelter Hedge By The Roadside

ONE of the continuous jobs on the farm is keeping the roadside free from noxious weeds. Every farmer is responsible for the eradication of gorse, blackberry, and other weeds on the roadside frontage of his farm from the boundary fence to the centre of the road.

As a rule the traffic keeps the roadway free, but the strip alongside the roadway is generally an ideal place for the propagation and growth of weeds. This area cannot be stocked efficiently so that a good sole of grass can be maintained. Hence, there is nothing to deter the spread of gorse and blackberry, which consequently get out of hand.

Unproductive Work

The farmer, who can keep these weeds in check only by constant attention to cutting, grubbing, spraying, and burning, has a considerable amount of his time taken up with this unproductive work. Unless he obtains permission to fence the area, he cannot destroy the weeds permanently by grassing and stocking or by planting trees.

The accompanying photograph illustrates a method by which the results can be obtained, and which also adds to the efficiency of shelter planted along the roadside. The tall shelter in the photograph is barberry. Growing at the foot of it, climbing almost to the top, and spreading over the ground between it and the metalled road is *escallonia exoniensis* (listed by nurserymen as *escallonia ingramii*) which

is effectively blocking ground draught and spreading by overground rooting stems towards the metalled road.

By occupying the roadside area, this plant is preventing the establishment of weeds and, if established where gorse and blackberry are present. would tend to eliminate these plants.

Ground Draughts

Barberry hedges are liable to thin out at the bottom, causing ground draughts. When this occurs the barberry hedge is usually cut short, so that leaves and branches form at the bottom of the hedge. As time goes on the hedge grows up, and the bottom again develops gaps. The planting of *escallonia* will save the recurring trouble of cutting down the barberry. Thus, a hedge develops which gives both high and low shelter.

Escallonia exoniensis does not appear to be a very vigorous plant. I believe that it is eaten by stock, and if this is the case it could not be used where stock have much access to it. Before planting, consideration should be given to its effect in giving shelter to vermin. In districts where rabbits are plentiful it should not be used for the purpose I have outlined. It will withstand a considerable amount of frost, and is used to a considerable extent as a hedge plant around homes and gardens.

—*J. E. BELL, Instructor in Agriculture, Auckland.*

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Eradication of Mexican Devil Weed

COMMONLY known as Mexican devil weed, *eupatorium glandulosum,* which is described by Dr. Allan in the "Journal of Agriculture," March, 1933, is causing anxiety to farmers in certain parts of the Auckland Province by its increase in growth and the difficulty experienced in eradicating it.

It is a shade-loving plant, and grows thickly and vigorously in rough, shaded valleys. Here the pastures are generally poor, and the land is covered fairly thickly with bracken fern. It also grows on the higher country where the rainfall is fairly heavy. Under these conditions the sward is generally becoming invaded with bracken fern, and here it establishes in the shade of fern clumps. It is also found growing strongly in the shade along the edges of bush areas, but it will not thrive in the bush itself.

A general view of dense growth of Mexican devil weed on a shady hillside.

Cutting and Pulling

Cutting and hand-pulling before the plant seeds is the usual method adopted for eradication. The plant has a very shallow rooting system, and, when soil conditions are damp, it is fairly easy to pull. Control by this method has not met with much success. The roots appear hard to kill, as, when the plant is pulled and turned with the roots exposed to the sun and weather, it has the power to re-root and exist until the seeds have matured. A thick crop of seedlings come away from the seeds during the following spring.

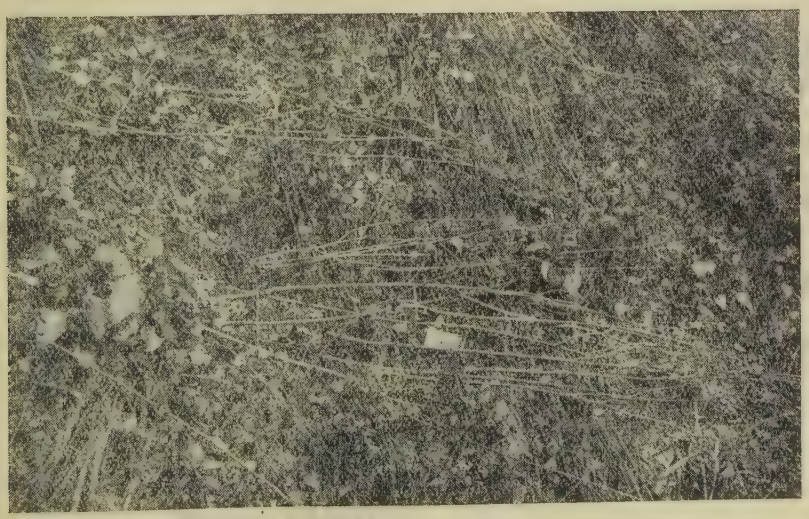
It is generally found in the shady valleys where the country is steep and carrying a poor sole of grass. It does not exist on clean country which is carrying good grass and is being effectively managed with cattle and sheep with the addition of topdressing.

Experimental Work

Experimental work has been carried out during the last two years by the Department of Agriculture to see whether the plant can be successfully eradicated with sodium chlorate. The following technique was adopted.

A hillside, taken where the *eupatorium* was thick, and was divided into eight plots each 50 lks. x 33 lks. The *eupatorium* was cut just above the ground on alternate plots, and half the cut plots were sprayed with a 5 per cent. solution of sodium chlorate, the others being dusted with sodium chlorate and lime mixed at 1 to 10. The four remaining plots, where the *eupatorium* was left standing, were treated in a similar manner.

Two applications of sodium chlorate were given to the plots, the first in October, 1937, and the second in January, 1938. The plots were cleared of all rubbish, which was burnt during the autumn of 1938, and the area was sown with a grass seed mixture consisting mainly of danthonia, browntop, and *lotus major.* Basic slag at at 2 cwt. per acre was also applied at the time of sowing.



Cutting—the usual method of control adopted by farmers. Note the dense second growth coming away.

Results

Because of wet, cold climatic conditions after sowing the establishment of grass was not very satisfactory, but the sodium chlorate treatments had shown their effect on the *eupatorium.*

Plots which were cut before dusting with sodium chlorate and lime mixture, and those sprayed with 5 per cent. solution, showed about a 60 per cent. kill. This suggests that if the applications were continued annu-

ally, a 100 per cent. kill should be obtained after three or four years' treatment.

The plots of standing plants which were treated with sodium chlorate in the same way as those in which the plants were cut showed that growth was checked, but very few plants were killed.

Best Method

Although no definite recommendation can be given from the experimental work carried out, it appears that the most practical method of dealing with this weed would be to cut the plants before flowering and treat them with a mixture of sodium chlorate 1 part and ground limestone 10 parts immediately after cutting. This should be followed by another dressing in early February. In early March the areas should be burnt to clean up the dead and dry foliage, and sown with grass seed together with basic slag at 3 cwt. per acre.

Spraying is not practical, as water is often difficult to obtain and to transport on the steep country where *eupatorium* usually grows.

Left.—A dead root killed by dusting sodium-lime mixture after cutting. *Right.* —A partially-killed root after treating as mentioned.

On many areas where *eupatorium* thrives, soil fertility is so low that it would be difficult for grass seed to establish. Consequently, if a fairly tight sward cannot be obtained, *eupatorium* will no doubt continue to appear, thus necessitating continuous treatment with sodium chlorate or pulling to keep this weed in check.

—*E. B. GLANVILLE, Instructor in Agriculture, Whangarei.*

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Penalty of Sowing Inferior-Quality Grass Seed

NOWHERE is the result of sowing inferior-quality grass seed more striking than on the reverting and reverted land in the Southern King Country.

Because of the ruggedness of the country, the high rainfall and the types of seed mixtures sown in the early days of settlement, much country is today carrying poor and indifferent pasture. Some of this land, which probably should never have been cleared of bush, has today reverted so far that it will take years of good management and topdressing before any appreciable improvement can be accomplished.

However, this does not apply to all the land, and, if small quantities of white clover have managed to survive, or if certified white clover and perennial ryegrass are broadcast with the topdressing, the high rainfall is turned to the advantage of the farmer. By exploiting these conditions, wonderful improvements can be achieved in both pasture cover and stock-carrying capacity in a very short period.

Suitable Mixture

In renovating land which has run to manuka the scrub should be cut and burned about six weeks later. If the scrub is left longer, much of the leaf will fall, and the chances of a poor burn are greatly increased. A suitable grass seed mixture for scrub burns of this type is:—Perennial ryegrass (certified), 12lb.; cocksfoot (certified), 8lb; white clover (certified), 2lb.; crested dogstail, 3lb.; *Danthonia pilosa*, 2lb.; browntop, 1½lb.; subterranean clover (Mount Barker), ½lb.; *Lotus major*, 1lb.; total per acre, 30lb.

This mixture is also suitable for sowing after a bracken fern burn.

It will be noted that seeds suitable for both first and second-class pasture are included. If pastures sown with this mixture are topdressed in the autumn each year the resultant pasture will most likely be white-clover-dominant, with perennial ryegrass fairly prominent and other grasses in lesser proportions.

If, however, the pasture is neglected and the fertility of the soil is not supplemented with topdressing, the browntop, danthonia, *Lotus major*, and subterranean clover will take charge. This pasture, although not so productive as the first type, will at least give a fair ground cover of hardy grasses, and will help to control weed invasion.

"Cheap Seed"

When a sward sown with a mixture of this type is compared with a pasture established from a cheap, inferior mixture of seeds of unknown type and quality it is surprising that any farmer even considers the purchase of inferior seed. To give some idea of the inferiority of "cheap seed," the following, which is a Government Seed-Testing Station report, is quoted. The "cheap seed" mixture was purchased in Taumarunui at 5½d per pound.

Percentage by weight.		Percentage Germination.
Red clover ..	25.1%	30% plus 2% hard seeds.
Ryegrass ..	22.3%	14%
Crested dogstail	19.5%	18%
Suckling clover	7.4%	45% plus 27% hard seeds.
Cocksfoot ..	5.2%	74%
Alsike ..	1.4%	——
White clover ..	4.0%	45% plus 15% hard seeds.
Yorkshire fog ..	trace	
Weed seeds ..	3.4%	(Sorrel, dock, vetch sweet vernal haresfoot trefoil, chickweed, self-heal ribgrass, hawkweed).
Inert matter ..	11.7%	(Chaffy material broken seeds)

Both the ryegrass and the white clover are of an extremely poor type.

The Penalty

This sample was sown before the analysis was known, and today the results show that the comment, "Both the ryegrass and the white clover are of extremely poor type," is absolutely true, as the farmer, who inadvisedly used poor seed, now has a field of flatweeds, sweet vernal, and sorrel, with a little white clover and ryegrass, and much bare ground.

With swards such as this, the buyer of "cheap seed" has to plough up his new pasture and start all over again. As a further penalty, he has to add to his cultivation expenses the extra cost of cultivation required to eradicate the weeds sown by himself. Added to all this is the dead loss of production from the field for 12 months, plus the price paid for the "cheap seed."

It is surely a much sounder practice to buy seed of known quality at the outset and be assured of success, rather than gamble with one's pastures. Bargains are certainly not available in the seed trade.

—W. T. BROWN, Fields Instructor, Taumarunui.

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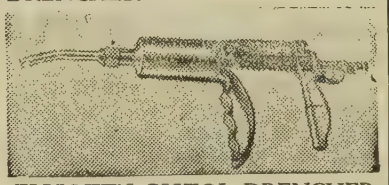

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The Orchard and Vineyard

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Orchard Notes

Handling the Crop

MOST of the work connected with the current season's fruit crop has now been completed, and the main apple and pear harvesting will soon begin. Cultivation for the season may cease, and cover crops, where required, should be sown immediately, as previously advised.

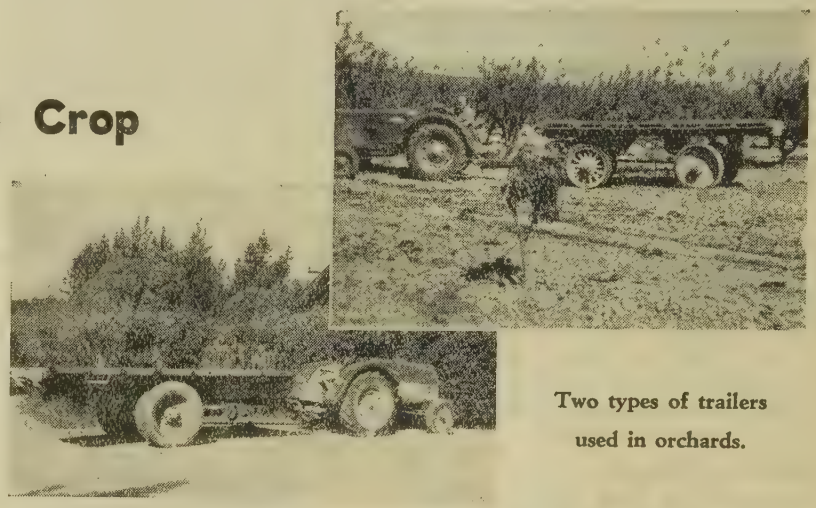
During February, and possibly into March, it will be necessary in northern districts to maintain an arsenate of lead coverage on apples and pears because of the danger of a heavy infestation of codling moth from a second brood. Red mite and apple leaf-hopper should be watched for and dealt with before their increase assumes dangerous proportions. On no account delay spraying for red mite until leaf injury occurs.

Summer-oil 1-100 will satisfactorily control red mite if thoroughly applied. A good summer control will prevent such a heavy deposit of winter eggs as to warrant an application of the more expensive winter-oil for their destruction.

Results of Season

The harvesting season should provide an opportunity for studying the results of the year's operations connected with the actual production of the crop. The orchard records may be completed by making notes on the condition of the trees themselves and also the condition of the fruit, thereby arriving at some conclusions as to the efficacy of the disease control measures applied.

It is important to note the condition of foliage towards the end of the season, as it is a sure index of the general health of the tree and the degree of control of foliage diseases obtained. It will also answer the question as to whether or not the sprays applied are causing any serious injury not actually apparent at the time of application, but which may have had a cumulative effect, becoming more apparent as the season advanced.



Two types of trailers used in orchards.

Close observation should be made at the time of picking for the presence of San Jose scale and other scale insects which attack fruits. Trees should be marked for treatment where affected fruits are observed.

Handling the Crop

Fruit for the fresh fruit market must be accurately graded according to the grading standards set, and must be carefully packed to ensure that full weight is given and that the minimum damage will occur to fruit in transit.

In addition, the grower has a responsibility in delivering fruit in the best possible condition in whatever circumstances pertain. Much may happen to fruit from the time it is fully grown until it is actually placed in the retail shop to damage it in such a way as to cause actual waste or reduce its value. However, by the co-operation of all concerned in the handling of fruit much may be accomplished in protecting a perishable article.

It is inevitable that under the emergency conditions applying at present quantities of fruit may have to be retained in ordinary storage for longer periods than is normally desirable, and it is in such circumstances that more than ordinary care is required by the grower in eliminating from the pack any fruit damaged in such a way as to impair its keeping quality, in studying maturity, and in exercising care of the fruit after picking until delivered so as not to hasten maturity subsequently.

Maturity for Picking

As a general practice, fruit for export or cool storage should be picked

at a stage before a fully-ripened condition is reached, but fruit for immediate local market requirements should be allowed to attain greater maturity. It is a growing practice by fruit exporters to leave the fruit remaining after the export pick to tree-ripen fully. Twenty-five to thirty per cent. of an apple crop is often left in this way without serious dropping.

Under the existing conditions it will be an advantage to the marketing authority to extend the harvesting season as much as possible by revising opening dates somewhat, by slightly delaying the first picking of mid-season varieties, and by leaving a greater percentage of the crop for the late pickings of tree-ripened fruit. The delay in starting may be increased according to the lateness of a variety.

Picking should be a matter of selection according to maturity and size to secure the most out of a crop. Much damage may be caused by careless or inexperienced pickers, and a little instruction will often prevent such damage.

Common causes of damage are:—(1) Dropping fruit into picking bags instead of placing them in carefully; (2) filling bags too full, especially when working on ladders; (3) roughly emptying bags into picking boxes; (4) using rough and broken picking boxes and over-filling; (5) jolting on unsuitable orchard trailers and light trucks. A good trailer or orchard truck is an important part of the outside equipment.

Fruit should not remain exposed to the sun while waiting for cartage into the shed or a cool place for temporary storage, but should always be stacked conveniently for cartage, taking advantage of all the tree shade possible.

Care in Grading

Extreme care should be exercised in handling the fruit through all operations in the packing shed. In the first instance, fruit-grading machines should be kept free from accumulating dirt by frequent cleanings, especially of those parts against which the fruit moves.

Growers are often unaware of the damage caused by grit and dirt on rollers of sorting tables and on the rollers in the screw-type of grading machines, as the marking of fruit does not become apparent until some little time after the packing when the abrasions caused have had time to discolour, by which time the fruit is actually on the market. This serious type of injury may be eliminated by exercising the necessary care. It is not too often to clean rollers during each interval in the working day.

Tipping fruit on to the grading machine hopper should be done carefully, and the fruit should be eased down from the tipped case by means of a canvas flap. Bins on the grading machine should not be allowed to overfill as packers are inclined to rake down fruit hurriedly, a common cause of stem-puncture.

Grading

The grading and packing of fruit must be done in an exacting manner to give a proper separation into the standard grades. Even a small percentage of lower grade or injured fruit in a grade is sufficient justification for rejection or degrading. Graders should check up on the fruit in the bins occasionally to satisfy themselves that the standard is being maintained.

In most instances the "fancy" grade predominates so naturally when operating a grading machine that this grade should be allowed to run through from the sorting table to the feed belt while the operators pick out rejects and lower grade fruit and select the "extra fancy" to be placed on another belt. This procedure leads to more accurate grading and a better maintenance of the standards than when the higher grade is allowed to run through and only the lower grades are picked out.

Packing

Much care is required in packing to avoid excessive bruising. Packing fruit incorrectly sized and "angle" packing are too common causes of packing bruises, which are quite avoidable by exercising just ordinary care. Fruit in one package should have no greater variation than ¼ inch.

When fruit is accurately sized and each placed on its cheek squarely in the case to preserve "pockets" and the pack is consolidated as the case is filled, especially by pressing the ends and sides, a reasonably tight pack is secured and little, if any, damage should result.

An endeavour should always be made to "crown" the pack so that, while providing sufficient bulge, the ends are not so high that they will receive any crushing during lidding. Advantage can always be taken of the size variation allowable in packing the topmost layers by selecting smaller fruits for the ends to keep them lower.

Shed conditions should always be perfectly hygienic. No reject, rotting, or diseased fruit should be allowed to remain indefinitely in or near the packing shed; otherwise fungal rotting in the packed fruit is likely to be encouraged, and thus greatly depreciate the value of a consignment.

—N. J. ADAMSON, District Supervisor, Nelson.

Citrus Notes

Eradication of Scale Insects

FEBRUARY and March each year are the best months for the eradication of scale insects, of which the most serious is the citrus red scale, *Aonidiella aurantii*. This sucking insect has caused considerable damage in many citrus groves, resulting in weakened and dying trees.

The citrus red scale is a shielded insect, the live insect living under two or more moulted skins. Reproduction is by living crawlers, and when it is realised that one female can produce up to 300 crawlers—and the hotter the summer the more crawlers produced—the reason for the possible rapid spead of this insect will be easily realised. Probably three or four life cycles occur

each year, but the most important reproductive period is during the next two months. Thus, this insect should be attacked at its most vulnerable period when in the "crawler" stage.

The red scale attacks fruit, leaves, and wood. On young trees the main trunk is often found encrusted with red scale, and many growers do not realise that this is often the cause of stunted, hidebound trees with the bark often split longitudinally. Such young unthrifty trees should be uprooted and burnt. For other and better trees the standard recommendation is two close ratio sprays of 3 per cent. certified summer oil.

Apply the first summer oil under fine weather conditions towards the middle of February, and the second three weeks later. Adequate coverage is essential, as oil sprays are contact sprays and, to be effectual, must enclose the insect. The effect is to smother it by blocking its breathing pores, or tracheae.

Value of Oils

The efficacy and value of the summer oils may be discussed at this stage. These spraying oils are obtained from crude petroleum by fractional distillation. They belong to the same fraction as the lubricating oils, with a boiling point range of from 250deg. to 400deg.

The composition of the fraction varies according to the source of the crude oil, the process of distillation, and degree of refinement. They consist of paraffin hydrocarbons, unsaturated hydrocarbons, and the aromatic hydrocarbons. The unsaturated hydrocarbons present in an oil are injurious to growing plant tissues. Hence, these must be removed by treatment with concentrated sulphuric acid, known as the sulphonation process. The unsaturated hydrocarbon content must be known, and this is generally done by the iodine value, as iodine will combine with the unsaturated to give saturated oils.

The relative viscosity and the volatility of an oil are important factors. The viscosity is the rate of flow of an oil, while the volatility is the rate of evaporation. Both of these factors are of importance, and govern the degree of permanence of the oil film. As oil and water cannot be mixed unless the oil is treated with an emulsifier, this is added in order to keep the oil globules dissociated.

Colour is not a reliable factor for the determination of the suitability of a spraying oil, the terms "winter" and "summer" oil being preferable. The time to apply the 3 per cent. certified summer oil for the red scale on citrus trees is after these notes appear. The toxicity of this spray depends upon the permanence of the oil film and its action in blocking the tracheae of the insects.

Cultivation

Cultivation of citrus groves should be continued until the green manuring cover crop is sown in March. In order to be prepared it is desirable to order the necessary seed and manure early, as too often the green manuring crop is sown later than intended, with the result that next spring's ploughing and seasonal operations are delayed or the full growth from the green manuring crop is not obtained.

During the hot summer months a good, clean circle should be maintained around each citrus tree or the mulching material retained in order to suppress weed growth.

Pruning operations may be continued at this period of the year, and every opportunity should be taken to have trees opened out before the application of the summer oil sprays.

—A. M. W. GREIG, Citriculturist, Auckland.

Viticulture

Vinegar-Making in the Home

VINEGAR is made from sugary and starchy substances by alcoholic and subsequent acetic fermentation. In France vinegar is made almost exclusively from wines. In the United States of America cider-vinegar is in great favour. In the British Empire the use of malt vinegar predominates, although other vinegars are manufactured locally, as, for instance, in parts of Wales and in Monmouthshire, where a quantity is made from perry and crab-apple cider. The principles involved in the manufacture of these vinegars are, however, identical.

Amateurs frequently find that the beer, cider, or wine they have made has not turned out quite what they expected—the flavour is not quite right, or there may be already a start of acetic fermentation, which renders it unpalatable. It may still, however, be suitable for making vinegar.

For flavour and aroma, home-made vinegars from red and white wine, cider, perry, mead, and the fermented juice of fruits such as currants and gooseberries are far superior to commercial vinegars, which are made principally from grain, glucose, or sugar, with the addition of caramel for colouring and artificial flavourings.

Essential Component

The acetic acid, which is the essential component of vinegar, is transformed from alcohol by a special ferment known technically as "Mycoderma aceti," or, more generally, as "mother of vinegar" or "vinegar plant," which forms a greyish film of fine network on the surface of the liquid. It is necessary that this film should remain on the surface, as it requires air for its development and to aid it in oxidising the alcohol.

The Mycoderma aceti also requires a warm atmosphere in which to work, from 70 deg. to 90 deg. F. being the most favourable. Higher or lower temperatures retard its growth. To facilitate the process the barrel containing the alcoholic liquor may be placed

outside in the shade, or, in cool weather, inside near the stove.

Use of Barrel

If it is not desired to use the barrel already containing the fermented liquid, or if its transformation therein is not practicable, a clean barrel which has contained vinegar, wine, or spirit may be used. It should be thoroughly scalded with steam or water beforehand, and then placed on its end and the top taken out and the open end covered with cheesecloth to keep out the vinegar-flies while the acetic fermentation is progressing; or, for continuous use, a barrel laid on its side with the bung-hole uppermost is more convenient.

This barrel should have two ¾in. or 1in. holes bored in the upper part of the ends, and these should be covered with fly-proof muslin, mosquito-net, or wire mesh which has previously been varnished. With the aid of the bung-hole, covered with similar material, a free circulation of air can thus be obtained. The hoops should be painted or varnished inside and outside to preserve them from the action of the acetic acid, which corrodes most metals, and a wooden tap placed 2in. or 3in. from the bottom of one of the ends.

The barrel must be firmly fixed, so that the vinegar plant will not be disturbed by vibration. It is then partly filled with alcoholic liquid, leaving about one-third or one-fourth of the barrel empty to allow a free circulation of air over the surface of the liquid.

Testing

To make a good vinegar containing 6 to 10 per cent. of acetic acid, the fruit juice, sugar, or honey solution should contain before fermentation from 12 to 20 per cent. of saccharine matter, which, when fermented, will produce from 6 to 10 per cent. of pure alcohol, and, when transformed by acetic fermentation, from 6 to 10 per cent. of acetic acid. In a liquod which has already fermented the desired strength can be regulated by diluting the water or adding sugar or honey and refermenting.

To test the saccharine contents of the original must or unfermented liquid a Baume hydrometer or a Brix or Balling saccharometer can be employed. Either of these can be purchased for 5s. to 6s. The degree Baume is equal to 2 per cent. of sugar in the liquid at 60 deg., and the Brix and Balling degrees are equal to 1 per cent.

If, on testing, the sugar contents are found to be insufficient, 4oz. of cane-sugar or 5oz. of honey should be added for each additional degree of alcohol or acetic acid it is desired to obtain. These figures are not scientifically exact, but they are convenient to work from and give results near enough for the purpose.

Right Ferment

To ensure the introduction of the right ferment and the exclusion of the Mycoderma vini—which forms a thicker film, of a whiter appearance than the Mycoderma aceti, and transforms the alcohol into carbonic-acid gas and water—a small culture of vinegar bacteria or Mycoderma aceti may be developed in a shallow basin or saucer in a warm corner from an alcoholic liquor, such as wine or beer, mixed with a little vinegar, and the film, when formed, transferred carefully to the surface of the liquid in the barrel.

The same result may be obtained by pouring 10 per cent. of vinegar from a previous brew into the contents of the barrel. The alcoholic fermentation must be complete before the vinegar ferment is introduced, or the yeast ferment will be stopped by the acetic acid and unfermented sugar will remain in the vinegar.

A strong alcoholic liquid is not so easily acidified as a weaker liquid. Therefore, when making strong vinegar it is advisable to start the barrel with a little fermented liquid of low strength (3 or 4 per cent.) and add the stronger liquid gradually.

Time Required

Under favourable conditions a good vinegar will result in about three months. If it contains more than 10 per cent. of acetic acid this will act as an antiseptic to unfavourable bacteria, but in vinegar of a lower strength when the alcohol falls below 1 per cent. the bacteria destroy the ethers and finally the acetic acid itself, which is oxidised to carbonic-acid gas and water or undergoes what is known as putrid fermentation. To obtain a perfect vinegar 1 to 1½ per cent. of alcohol should remain unconverted. This increases the flavour of the vinegar when maturing in the barrel.

The amateur who has no means of ascertaining when this point is reached may arrest further development when in his judgment a full vinegar flavour had been obtained. If not already clear and bright, the vinegar may then be filtered through a flannel bag or clarified with isinglass, and then heated up to 130 deg. F. to ensure good keeping qualities by killing all bacteria, ferments, or vinegar-eels. It may now be run into a clean barrel and stored for a year, which will greatly improve its flavour. The barrel should be kept tightly bunged and vinegar added from time to time to replace that which evaporates through the wood.

Bottling

If it is desired to bottle the vinegar at once it should be allowed to cool before doing so, or, better still, it may be run into bottles cold and pasteurised at 130 deg. F. in the bottles. A convenient method for withdrawing the vinegar from the cask when no tap has been inserted is to siphon it off through a small rubber tube attached to the lower end of a stick, so that its lower end will be well above the lees, which should not be disturbed. The stick is then let down into the barrel, and the vinegar siphoned off into the bottles.

In the continuous barrel process about one-third of the vinegar may be drawn from the barrel and the same quantity of fermented liquid added through a glass funnel with a long spout so as not to rupture or precipitate the Mycoderma aceti film. This operation can be repeated whenever the vinegar is ready to draw.

Clarifying

To clarify vinegar which is not clear and bright the substance giving the best results is isinglass, employed at the rate of 1oz. per 100 gallons of vinegar, broken up into small pieces, and each ounce soaked in a gallon of warm vinegar until it swells up and becomes soft. It should then be passed through a hair sieve and any lumps that are retained broken up.

The solution should be of a perfectly smooth consistency before being used. In this condition it can be added to the bulk of the vinegar, thoroughly mixed by stirring with a suitable piece of wood, and allowed to stand about

a week to permit the isinglass to settle to the bottom, dragging down with it the substances which were the cause of the cloudy appearance in the vinegar. The clear vinegar can then be siphoned or drawn off through the tap.

In order to avoid the introduction of the Mycoderma aceti into honey or weak alcoholic liquors such as beer, cider mead, or wine, vinegar should not be manufactured in or near buildings in which these are handled or stored.

Vinegar is manufactured wholesale by the quick, or German, method, which requires a considerable plant.

—J. C. WOODFIN, Vine and Wine Instructor, Te Kauwhata.

Cool Storage Notes

Prepare Plant for the Fruit Season

OWNERS of fruit cool stores should ensure that all the refrigerating plant is in good working order before undertaking the work of the forthcoming fruit season. Only by utilising fruit cool storage facilities to their full capacity throughout the fruit harvesting period will it be possible to maintain the condition of the fruit while holding it temporarily in cool storage, and to regulate the supply of fruit to meet the demand.

By the temporary holding of much of the fruit in this manner it will be possible, by the removal of the heat, from the packed fruit, to maintain it in better condition while awaiting and during distribution. If large quantities of fruit are packed and held for too long without cool storage, fungal rotting will develop with the advancing maturity of the fruit, and re-packing and losses from wastage will result.

Do Repairs Now

To enable the cool storage plants to cope with the extra amount of fruit, the refrigerating equipment will need to be in good working order. Therefore, any repairs to the plant should be done without delay if the work of the store during peak periods is to proceed without the annoyance and loss in the efficiency caused by stoppages or faulty equipment.

The question has often been asked, "To what extent does the amount of fruit going through the store affect power costs?" The increase is not nearly so much as might be expected. Assuming as a basis that the store is once filled, it will require only 20 per cent. more power if the throughput of fruit is doubled, and 40 per cent. more power if it is trebled. The reason for this is that the major proportion of the expenditure of power is in counteracting the insulation losses, which remain the same whether the store is filled or not.

The secret of cool store operating economy, therefore, is to be found in making the maximum use of the space.

Removing Odours

Having painted the cooling coils in fruit cool storage chambers, care should be taken to leave the chamber doors open. This will assist in quickly removing paint odours in time to receive the new season's fruit for storage. All fruits are very quickly tainted by strong odours from chemicals, paints, etc., especially when bitumen, tar, or kerosene has been used. After using paints in fruit cool storage chambers, be particularly careful that the paint smell has disappeared before the chambers are again used for fruit storage.

—A. POWELL, Cool Storage Officer, Wellington.

Tobacco Notes

Topping and Suckering

TOPPING should begin as soon as 70 per cent. of the crop is in blossom. With a small plantation it is advisable to leave the remaining 30 per cent. of young and backward plants to be topped later, after they have matured and flowered in the usual way. As time may not allow of this procedure where a large tobacco crop is concerned, all plants of a size which promise to be of commercial value should be topped along with the main crop, irrespective of their being in blossom or not.

Many New Zealand tobacco growers do not give enough thought and care to this seasonal operation. A poor tobacco crop may be brought up to almost normal standards by the adoption of wise and proper topping; on the other hand, a good crop may be seriously damaged by careless topping. Topping cannot be standardised, as so much depends on the variety of tobacco grown, the soil, and the climatic conditions prevailing both before and during the time topping is in progress.

Points in Topping

The two most important points to remember in topping are:—

1. In a wet season topping should be done lightly, allowing the plants to

(*Continued on page 63.*)

The Home Garden

Small Fruits and Flowers

Vegetables

Care of Tomato Plants

BY the middle of January outdoor tomatoes should be coming to maturity. Birds may attack the fruit, but damage is reduced to a minimum if all fruit is picked as it matures.

Care must be exercised in defoliating the plants. This can be overdone, to the detriment of the crop. All that is necessary is to thin out the leaves should they be very dense, as they are likely to be on over-rich ground, and to remove those leaves which show signs of yellowing through old age.

By removing these older leaves, only useful leaves are left on the plant. Light may then penetrate to the fruit, and useless foliage does not check air from circulating freely. After being removed the leaves should be burnt.

The tying up of the plants and nipping out the tops when they reach the height of about 5ft or reach the tops of the supports should be attended to.

What To Do in the Vegetable Garden This Month

Summary of operations for the month (until the middle of February).

SEEDS TO SOW.

Spring cabbages, lettuce (allow to mature without transplanting), spinach, silver beet and carrots.

SEEDLINGS TO TRANSPLANT.

Savoy cabbage, kale, broccoli, cauliflower, Brussels sprouts, leeks and celery.

SPECIAL NOTES FOR WARM DISTRICTS.

Continue sowings of dwarf beans for late cropping, and sow turnips and swedes.

GENERAL WORK.

Spray for potato and tomato blight.

Use derris dust to control white butterfly.

Water well when necessary, and maintain a surface mulch to conserve moisture and destroy weeds. Make this cultivation shallow where crops are approaching maturity.

Dig under any harvested crops, such as peas and beans, but burn potato haulms and cabbage and cauliflower stumps promptly.

Tie up and prune outdoor tomatoes.

Sow a cover crop on any ground that is not being used for cropping.

Harvest onions as they mature (see last month's notes).

Tomato Glasshouses

By the middle of January the harvesting of tomatoes in the unheated glasshouse will be drawing to a close, and the house should be cleaned up in preparation for further cropping. On a still night close the house and burn sulphur in it at the rate of 2lb. per 1000 cubic feet of glasshouses space. Next morning the house may be opened and allowed to air.

The vines should be cut several inches from the ground and left suspended for several days to dry, so that they will burn readily and generate sufficient heat to dry and burn the roots, which are removed from the house at the same time as the vines and supporting twine.

After these operations have been completed the house should be thoroughly cleaned of cobwebs and dust, and the woodwork and concrete whitewashed or painted. This time of the year offers a very good opportunity of effecting any repairs that may be required.

The soil, if it is not to be removed and renewed, should be dug over and prepared for the sowing of a cover crop.

Random Notes

Artificial Liquid Manure

MANY gardeners have difficulty in obtaining fresh animal manure, and this is a handicap in making liquid manure, which is so beneficial to so many crops. A substitute can

be made out of ordinary commercial fertilisers, using nitrate of soda, superphosphate, and one of the forms of potash (the sulphate, the chloride, the 30 per cent. salts, or kainit). These can be mixed in the proportion of 1 part of nitrate of soda, 4 parts superphosphate, and 1 part potash.

The mixture should be stored in a dry place in airtight tins or jars. If exposed to a moist atmosphere, it is inclined to set. Its effectiveness, however, does not deteriorate, and, as it is used in solution, it is not important that it be in a granular condition. The mixture does not dissolve completely, but forms a milky suspension.

A level tablespoonful of this mixture to a gallon of water is the strength at which it may be used, and it may be applied at weekly intervals, if desired.

When Marrows Fail to Set

FREQUENTLY, bush marrows bloom but do not develop; the flowers merely wither and drop off. The plants carry both male (pollen-bearing) and female (fruit-forming) flowers. These are not difficult to distinguish, the female flowers showing an enlargement behind the petals which develops into the marrow. The male flower shows no such enlargement.

If the male flower is removed from the plant and the petals torn from it, leaving only the centre portion holding the pollen, this may be inserted into the female flower, and there should be no further difficulty in getting the marrows to set.

The Flower Garden

General Work

DURING the hot season there is not a great amount of work to be done in the way of planting out. Bulbs which have been lifted and which it is intended to replant, however, should be replanted immediately or stored in a cool, dry, airy place and planted not later than the end of March.

Sowings may be made of hardy annuals and biennials in boxes or beds for transplanting in the autumn. The soil should be protected from the direct rays of the sun until the plants appear above ground.

Strict attention should be paid to the control of weeds to prevent seeding. The dry weather offers an excellent opportunity to eradicate twitch grass and difficult perennial weeds.

All spent blooms should be removed regularly, and, as suggested in these notes last month, the flower stalks cut back to buds, which should produce strong growth for later blooming.

When watering, the soil should be thoroughly wetted in the evening and the surface loosened next day to reduce evaporation of the water. It is almost useless to spray the plants and the surface of the soil for short periods at frequent intervals. It encourages a root development near the surface of the ground and not in lower levels.

Seasonal Don'ts

Don't

waste lawn clippings. They are a very valuable source of humus. In the summer they may be placed, about 2in. deep, over the ground between rows of vegetables, where they remain on the surface as a mulch and keep the ground cool and moist. When the autumn rains come the mulch will rot quickly and, worked into the ground, will provide a beneficial increase to the humus supply.

Don't

burn anything (except potato haulms and tomato vines and leaves) that will rot fairly quickly and form humus. It is much better placed on a compost heap if there is not a trench open in which it may be thrown and buried. The compost heap provides very valuable material for digging in. The heap may be a place where all forms of garden and house refuse can be deposited. A certain amount of soil is added from time to time with weeds and the roots of plants. The mixture forms a very friable material when it rots. It is unwise, however, to use anything that is diseased or seedy, as the compost is likely to perpetuate disease fungi, and would propagate weeds. Should weeds appear when compost is used, they should be hoed off. The humus contained in the heap more than compensates for the trouble involved in destroying any volunteer growth which appears. The compost heap should be located in a shady place where it will remain reasonably moist at all times.

Bulb Planting

BULBS which are not benefited by a long storage season, and those which produce winter and early spring blooms, should be planted as soon as possible. This applies in particular to narcissi. The depth of planting depends largely on the condition of the soil, but as a general rule they are planted at such a depth that the top of the bulb is twice the length of the bulb below the ground.

The growth of the bulbs is improved if well-rotted farm manure or a cover crop is trenched into the ground. The cultivation should be deep, and this material should be as near to the bottom as possible. The soils most favoured are well-drained loams overlying a porous subsoil. The artificial manures recommended are of the slow-acting phosphate type. Finely-ground bonemeal or the coarser bonedust are both very suitable, and may be used at the rate of ½ ton to the acre (equivalent to 4oz to the square yard).

Tulips require similar conditions, and for best results on light, well-drained soils may be planted as deeply as 9 inches. It is an advantage to plant these as soon as possible to avoid the spread by aphides of the virus causing striping. Tulips will not bloom earlier with early planting.

In warm districts anemones for winter flowering should be planted as soon as supplies of the corms can be obtained. They should be grown in well-prepared soil, which should not be allowed to dry out and interrupt their growth.

Small Fruits

Cover Crop

THE small fruit plantations from which fruit has been picked should now receive some attention. After the necessary thinning out and pruning (as described last month) has been done, a dressing of farm manure and artificial fertilisers should be applied and ploughed under. This ploughing should be shallow to avoid root injury in established plantations. For raspberries, red currants, and gooseberries sulphate of potash should be included in the dressing of artificial manures.

Where farm manure is not available, a cover crop may be sown after the land has been cleaned up and ploughed.

This crop will not compete seriously with the bushes for soil moisture, as it will not have made much growth until the autumn rains come; nor will it compete seriously with the bushes for light. It will establish and will check the development of weeds and supply green material for ploughing into the ground about July. A broadcast dressing of 2 cwt. of superphosphate at the time of sowing the cover crop is a great advantage both to the cover crop and to the plantation of bush fruits.

Strawberries

AREAS for autumn-planting of strawberries should be prepared. For successful strawberry-growing it is essential that the soil should be free of perennial and twitchy weeds, and should not dry out in the summer months. In soils which dry out there is the frequent possibility that the grass grub will destroy many of the plants, and on light soils of this class it appears practically impossible to prevent this.

The preparation of the land after cleaning consists of ploughing under a liberal dressing of blood and bone, superphosphate and sulphate of potash, and harrowing down until the surface is moderately fine. Occasional light cultivation will destroy seedling weeds. The planting should be done as soon as the plants are ready, and even in the warmer districts should be completed by the end of April.

Preparing New Areas for Bush Fruits

WHERE plants of small fruits are to be purchased for planting this season it is not too soon to order them now. The preparation of land for planting new areas, if not already done, should be undertaken as soon as its present crop has been harvested.

When cleared, a green cover crop should be sown. A quick-growing cover crop will be sufficiently advanced to plough in and give good results by May or June, when the planting of permanent bush fruits can be undertaken.

The following table of planting distances will be of assistance in determining the numbers of plants required:—

Type of Plant.	Distance between rows (feet).	Distance apart in row (feet).	No. Required Per Acre.
Currant (black)	6 to 8	3	1815 to 2420
Currant (red)	6 to 8	4	1380 to 1815
Gooseberry	6 to 8	5	1089 to 1452
Raspberry	6	1 to 1-1/3rd	5448 to 7260
Raspberry (vigorous varieties such as Lloyd George)	6	3	2420
Loganberry	6	6	1210
Boysenberry	6	8 to 10	726 to 907
Strawberry (warm districts, 1-yr. crop)	24 to 27 inches	9 to 12 inches	21,780 to 25,813
Strawberry (cool districts, 3-yr. crop)	30 to 36 inches	14 to 16 inches	12,500 to 13,068

TOBACCO NOTES—*Continued from page 60*

retain practically their full complement of leaves.

2. If the season has been dry, with indications of dry conditions continuing until well after topping has been completed, heavy topping should be done—that is to say, the crop of a variety carrying 18 leaves to the plant should be reduced to 10 leaves, and to a similar proportion in other varieties.

A crop grown during a dry season is invariably poor; the plants are stunted, and the leaves small, thin, and papery. This type of crop ripens prematurely, often so rapidly that it cannot be coped with, and the result is that a large quantity of the leaf becomes ripe on the plant. Such leaf eventually becomes a total loss to the grower. Leaf harvested under seasonal conditions of this kind lacks body to such an extent that it breaks down under the curing process, and is then of very little value.

Heavy and Light Topping

By heavy topping the plant food previously drawn upon by the seed head and top leaves is diverted to the 10 leaves remaining on the plant, which quickly fill out and grow to normal size, texture, and quality. When harvested, these leaves present no abnormal difficulties in the process of curing.

In a wet season the crop nearly always grows rank and coarse and fails to ripen at the proper time, often continuing to grow throughout the harvesting period without ripening at all, and, when harvested, only a very small percentage of bright leaf is obtained from each curing batch.

By topping lightly and leaving the full number of leaves on each plant the reverse effect to that of heavy topping is obtained, and the effects of the wet season are largely counteracted.

The young, newly-formed leaves remaining at the top of the plant draw so heavily on the food supply that the flow to the lower fully-grown leaves is, to all intents and purposes, cut off, thus reducing the tendency to rank growth and allowing the leaves to ripen in the usual way.

Suckering

About 10 days after topping, suckers or laterals appear in the axils of the leaves, due to an attempt by the plants to reproduce themselves. These suckers should be removed at least once a week. In normal circumstances these growths should not be allowed to remain on the plant for any time after they have obtained two inches in length, as from this size onward they begin to draw so heavily on the plant's food supply that in a very short time the main leaves are starved and become thin and papery, with immature ripening setting in.

When suckers make an appearance early in the plant's growth, particularly around the base of the plant, it is an infallible sign that the plants have been raised from inferior seed.

—*U. A. YELDHAM, Tobacco Instructor, Motueka.*

APIARY NOTES

Contributed by Officers of the Horticulture Division

Points in Extracting the Honey

BY this time of the year the extracting of the honey should be in full operation throughout the Dominion. Some bee-keepers who have a large supply of drawn combs on hand prefer to leave the honey on the hive as long as possible. They claim that by so doing the honey has a better chance of ripening more thoroughly.

Where there is a good flow on, however, most bee-keepers prefer to remove and extract the honey as soon as sufficient honey is available, and by extracting the combs and replacing them on the hives they obtain a larger crop.

Remove Only Ripe Honey

It would be advisable for bee-keepers who have not had much experience in extracting to remove only such honey as is fully, or nearly completely, capped over by the bees. In very dry districts, if the weather is fine, a little more latitude may be given. In such cases, if the combs are at least three parts capped over it should be reasonably safe to extract, but this should be done only in dry weather.

Honey in a damp or humid atmosphere will absorb moisture. Should the weather during extracting turn wet, all extracting operations should cease, and what honey is in the tanks should be well covered.

Cleanliness Essential

All utensils for dealing with honey should be thoroughly cleaned before extracting operations are started. Also, the floor and walls of the honey house should be given a good scrubbing with hot water and allowed to dry. There should be no suspicion of moisture or stale honey in the vicinity; otherwise there is a grave danger of fermentation being set up in the new season's honey.

Everything should be in readiness, and all hives, frames, and other unnecessary articles removed to allow plenty of room.

The Extractor Room

Early extracting is necessary when there is a scarcity of combs and supers in order to return the combs to be refilled. In view of this possibility, attention should be given immediately to the extracting room to ensure that it is ready for operations.

First, clear out all unnecessary material in order to leave plenty of room in which to work. (In summer time the extracting room is quite hot enough to work in without having the space restricted by unused hive bodies, etc.) The extractor itself should be cleaned out and tested to see that it is in good working order.

It is sometimes found to be broken in some part, and will need repairing before it can be used. Next attend to the honey tank and strainers, and also the uncapping knife and rubber tubes if a steam knife is used. The steam boiler and capping melter should also be examined.

Success in any business cannot be achieved without preparedness, and perhaps this is more necessary in bee-keeping than in most pursuits.

Uncapping combs before extracting.

Firm Foundation

Bee-keepers who have secured an extractor and are using it for the first time should take special precautions to have it placed on a very firm foundation. It is absolutely essential for it to be so fixed that it cannot rock when being used; otherwise it will be certain to break the honey combs, and it is also likely to break the extractor itself. The smaller the extractor, the more necessary it is to secure it firmly.

As a rule, beginners start with a two-frame extractor. This is large enough for an apiary of up to 30 colonies, but when the apiary grows to 50 or more it is advisable to procure a larger one. Therefore, if it is the intention to increase to more than fifty hives, it would be best to procure a four-frame extractor in the first place.

If, however, expense has to be taken into consideration, a two-frame extractor will be quite sufficient for a while, and, as there is always a fair demand for them, they can generally be sold second-hand at a reasonable price when it is desired to purchase a larger machine.

Best Position

The extractor should be fixed in the most convenient position in the room. If the floor is of wood, see that it is set over a pile where the floor is firm. If necessary, extra support should be given to the floor, as, when the heavy frames of honey are being revolved at a high speed, the extractor will shake if the floor is not firmly built.

If the floor is high enough off the ground the best plan is to cut out a small well just where the top of the extractor is to come, and high enough to take with ease a larger bucket or benzine tin. The extractor can then be fixed to the floor. This arrangement saves much lifting of heavy supers of honey, which is necessary when a raised platform for the extractor is built. The well for the bucket should be lined so that no bees can gain admission through it under the floor.

If, however, it is found desirable to build a platform, it must be built of very stout timber and well braced to keep it absolutely rigid when the machine is in motion. Stout screws should be used to fasten the base to the boards, as well as three anchor rods equally spaced and fastened securely to the floor and the top of the extractor. These rods are made so that they can be tightened by a screw adjustment.

Holding Tanks

It will also be necessary to have tanks to hold the honey when extracted. These should be made of tinned steel, and should have a capacity of at least a ton. They can be purchased from the suppliers of bee materials. These tanks will need to be raised high enough to allow a 60 lb. tin to be placed below the tap.

Straining the honey when taken from the extractor will also need consideration. Some bee-keepers have a double strainer or two strainers, the top one being of a fairly coarse or open mesh to strain the larger particles of wax and broken comb, and the lower one of finer mesh to separate the pollen, etc.

A good plan is to have a piece of cheese cloth stretched over the top of the tank, and over this an empty super, to the bottom of which is fastened a piece of wire cloth. This is kept above the tank by two long pieces of wood nailed to the sides, long enough to reach across the tank and resting on its top edge. The honey is then lifted from the extractor and tipped into this box strainer. All these preparations should be made in advance of the extraction season.

Keep Room Bee-proof

It is essential to prevent bees or other insects from gaining admission. It is almost impossible to avoid having a few bees carried in on the combs, but windows and doors should be covered with wire cloth in such a manner that bees can escape from the room without admitting any robber bees. There is little or no danger in this respect while the honey flow is on, but should the honey flow cease because of bad weather conditions or late extracting, then the bees are looking for every opportunity of robbing the honey.

As far as possible, the honey tanks should be kept well covered. Nothing is more discouraging than to find that, through some person leaving the door open or through some unexpected crack, the bees have gained admission and started to rob the honey extracted.

It is not so much the loss of the honey as the great loss of bees that may occur through their being drowned in the honey tank or extractor.

—G. V. WESTBROOKE, Apiary Instructor, Hastings.

Section, or Comb Honey

WHEN making a start with only a few hives, many bee-keepers who do not have sufficient to warrant the purchase of a honey extractor find it more profitable to raise comb honey in one-pound sections. The successful production of this class of honey is not merely a matter of putting on a super or half-super of sections and leaving them until filled. To raise a payable quantity requires a very strong force of young worker bees, and to get the colony up to this condition necessitates having a young, vigorous queen and plenty of room in the early stages to allow her to raise the maximum number of bees. Care must be taken to prevent them swarming out and so weakening their numbers.

When the hive is well filled with worker bees one super of honey or brood may be taken off and replaced by a super of sections. By this method the bees are forced to the sections through lack of room, and if the honey is coming in freely they will at once begin to draw out the foundation wax and fill the sections rapidly. As soon as the sections are capped over they should be removed from the hive and new ones put in their places. The full frames which are removed may be placed over another hive which is being run for extractor or strained honey, or, if mostly brood, they may be given to build up a weaker colony.

Careful Handling

Section honey requires very careful handling, and care must be taken to avoid bruising any of the capping and causing the honey to leak. When removed, they should be carefully cleaned by scraping off all the propolis or wax that has become attached to the wood. Nothing is more likely to prejudice the buyer than to see dirty-looking sections of honey. When well cleaned they should each be wrapped in white cellophane, and then placed on the market in a neat and appetising style.

By paying attention to these details one makes an attractive article which will appeal to the public and so increase the consumption of honey.

Notes for the Poultry Farmer

Contributed by Officers of the Livestock Division

The Art of Culling

IT is well known that there is a marked difference in the producing capacity of hens of different breeds, and of individual birds of the same breed and strain, in spite of the fact that the birds have been carefully bred, managed, and fed in the same way.

For these reasons the art of culling, or eliminating from the flock those birds that are not likely to produce sufficient eggs to give an adequate return for their keep, is one of the greatest essentials to successful poultry-keeping.

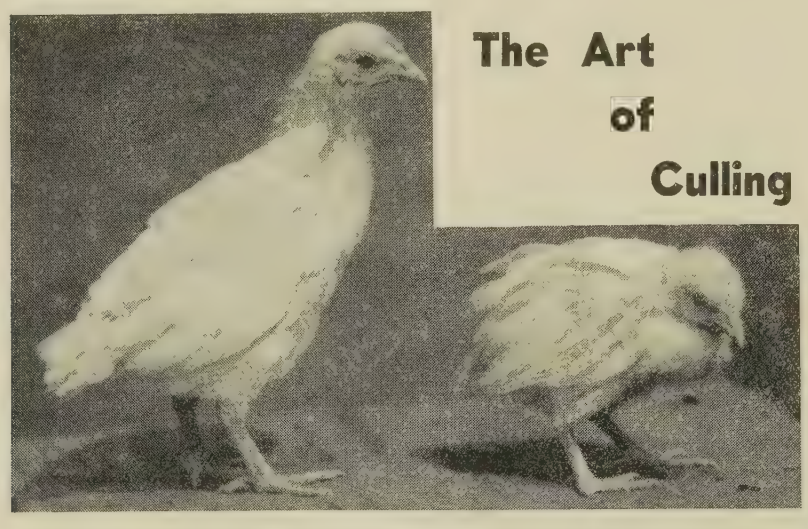


Fig. 1.—Two White Leghorn chickens of the same age and from the same hatch. The bird on the left is strong and healthy, while the bird on the right is a weak specimen and never likely to be profitable.

When to Cull

The modern utility White Leghorn hen is expected to produce about five times her own weight in eggs during her first laying year. This production very largely depends upon the ability of the hen to eat and digest a large amount of food in excess of that required to build up wasted tissues and maintain natural conditions. Therefore, one must realise the great importance of physical strength and constitution.

Just as there is a marked difference in the producing capacity of hens, so there is a variation in their vigour and vitality, and for this reason, if the best results are to be obtained, culling must be almost a constant job, especially on the commercial egg-farm.

To start with, there is usually a certain number of weak chickens in each hatch. These should be destroyed, for only good, strong chickens should be placed under the brooders.

The weak chicken can usually be picked out by its small, short, thin body, squeaky, peevish voice, and thin, pale shanks and beak. It lacks activity, appears dull and stupid, has a poor appetite, and is slow to learn to feed and drink. On the other hand, the strong, healthy chicken has a plump, full body, good strong well-coloured shanks and beak, is very active, and has dark bright eyes standing out like beads. It soon learns to eat and drink, is difficult to catch, and appears quite independent.

Watch Constitutional Vigour

As constitutional vigour is so important, it is advisable to keep a careful watch on each batch of chickens as they grow, and any that fail to develop like the majority or suffer from indigestion, diarrhoea, or other ailments should be culled, or at least marked so that they will never reach the breeding pen. This is advisable because it is quite possible that some such birds may appear to grow out of a weakness, but there is always the danger of a weakness being inherited, and if these birds are used for breeding the weakness is likely to be transmitted to their offspring. .

Fig. 1 shows two White Leghorn chickens of the same age and from the same hatch. The bird on the left is strong and healthy and has done well since birth, while the bird on the right is a weak specimen that is never likely to be profitable. Such birds should be destroyed, for they are a danger in any flock. They are susceptible to any ailment, and are likely to start trouble, or even an epidemic.

Fig. 2 shows two Black Orpington chickens of the same age and from the same hatch. The bird on the right is a normal healthy specimen and has done well, while the one on the left is stunted and is never likely to give the best results. Such a bird may grow out of the apparent weakness, but it is advisable to cull it from the flock, or at least it should be marked so that it will never be used for breeding purposes.

Culling Pullets

It is a good plan to give the pullets a careful inspection when they are being placed in their laying quarters. Any backward or unthrifty birds should be culled, together with those showing any deformity, such as

"dropped tails," twisted backs or beaks, or any physical weakness.

Quite a few poultrykeepers are reluctant to cull pullets, but it is advisable to remember that only birds with sound bodies, showing vigour and constitution, are likely to stand up to the strain of long, continued, profitable egg-production.

It is also advisable to keep a careful watch on pullets during their first laying year, and if a ring is placed on the legs of those that may suffer from any ailment or show undesirable characters, such as excessive broodiness, the laying of small or poor-shaped eggs, etc., later culling and selection will be more efficiently carried out.

Culling the Adult Flock

As indicated, the most business-like plan is to cull regularly and to get rid of the unprofitable birds as soon as they are detected, for the poultry-farmer who culls his flock only once a year is not likely to obtain the very best reward for his labour.

However, the best time to do the main culling is immediately the poorer birds stop laying, which is usually during January or early February. A good time to select breeding stock is during February or March.

It is true that some birds moult before January, but on well-managed plants only a few of the poorer birds moult before that time. If a large percentage cease laying and go into a moult in December, it is usually a sign of some mismanagement, and such conditions are an indication of underfeeding.

Main Conditions

Before starting to cull a flock consideration should be given to the conditions under which the birds have been managed. For instance, if birds have been subjected to a change of house or yard or a sudden change of feed, say, in December or January, many good birds may be driven into a moult.

Birds housed under artificial light during the autumn and winter will usually moult earlier than others.

Yearling hens which started laying during last February or earlier will not lay as late as the second-year hens which did not begin laying until August because of their undergoing a moult during the autumn. As it is very difficult to cull a flock of birds of different ages satisfactorily, it is advisable to keep those of various ages apart, and if this is not practicable at least the birds of different ages should be marked.

Fig. 2.—Two Black Orpington chickens of the same age and from the same hatch. The bird on the right is healthy, while that on the left is stunted and never likely to give the best results.

Age to Keep

Birds which are 2½ years old or more should be culled as soon as they stop laying, for after that age very few hens are profitable, unless, of course, the birds show exceptional breeding qualities.

Early Moulters

Experience has shown that the first birds of a given age to moult are usually of weaker constitution and poor layers, and it is usually safe to cull these. The last hens in a flock to moult are generally the strongest and best producers.

All birds showing lack of vitality should be culled. Such birds are usually inactive, weak of head, dull of eye, and often show a looseness of feather. Slow-moving, sluggish birds are never great producers. The best producers are those which are constantly on the hunt for feed and never seem satisfied with the amount of food given them. They are first off the perch in the morning, and last to go to roost at night.

The big eaters are usually the best layers. It will be noticed that increased food-consumption means increased egg-production. The good producers have good crop capacity and good depth of abdomen, while the culls have small crops and less depth of abdomen.

Heavy Birds

Any exceptionally heavy hens for the breed they represent or over-fat birds are better culled, for such birds are not good layers. Birds of the yellow-fleshed breeds, if they have been producing heavily, will have pale beaks and legs at this time of the year, while the poor producers and the over-fat birds will usually have yellow shanks and beaks.

The novice will find that the medium birds are the most difficult to select, for they may have some good and some bad points, and it takes much experience to classify them. However, the poor to medium birds are usually on the small side, and lack vitality or that quick alert movement.

Exceptional Cases

As indicated, the culling points given cannot be applied regardless of the method of management of the birds. For instance, some hens which have been broody a few times during the year may just now show those points that indicate good producers, or a hen which has reared a batch of chickens may also show up well. It is advisable to place a ring on the leg of a hen each time she goes broody, and if broodiness occurs three times during the season the bird should be culled.

Good Birds

The best birds will have good length, breadth, and depth, with broad backs, the width carried well back to the tail. The chest will be square and full, and the abdomen deep and full. The texture of the skin and abdomen will feel loose, soft, pliable and velvety.

N.Z. Federation of Young Farmers' Clubs

Edited by S. Freeman, Dominion Organizing Secretary

South Island Scholarships Awarded

MR. A. C. Cameron, Chairman of the Otago & Southland Council for the New Zealand Federation of Young Farmers' Clubs, announces that the selection committee, consisting of Mr. J. W. Woodcock (Field Superintendent, Department of Agriculture), Mr. W. R. Harris, Invercargill (vice-chairman of the Otago and Southland Council), and himself, as chairman, have considered the South Island applications for Young Farmers' Clubs Scholarships at Lincoln College, and have made the following awards:—

Scholarship Offered by Canterbury Agricultural College Old Students' Association for Competition Throughout the South Island.—This is awarded to John Alexander Porteous, a son of Dr. W. J. Porteous, Dunedin. Mr. Porteous is 20 years of age, and is a member of the Enfield Young Farmers' Club. He has held the various positions as secretary, treasurer, chairman, and delegate on the North Otago district committee. He has shown a very keen interest in the work of the movement, and his character, enthusiasm, and work have contributed materially to the successful running of the Enfield Club. He was educated at John McGlashan College and the Waitaki Boys' High School, and he has an excellent scholastic record. In his second year at Waitaki (Form V) he gained the first prize in agriculture for his form, and also the Douglas Memorial Cup for agriculture, open to all senior students. He also won a number of cups for tennis, running, etc. Since leaving school two years ago he has been acquiring farming experience in North Otago, and he has excellent testimonials from his employers. Apart from Young Farmers' work, he has shown a keen interest in various activities in the districts in which he has been working, and has the reputation for being businesslike and possessing sound judgment.

Southland Frozen Meat Company's Scholarships.—This year the Southland Frozen Meat Company has kindly awarded a further two scholarships available for members of Southland Young Farmers' Clubs. After consultation with the Southland committee, these have been awarded as follows:—

One scholarship to Kenneth J. W. Hargest, Woodlands, Southland. Mr. Hargest is 19 years of age, and is a son of Mr. James Hargest, M.P. Until a year ago he was secretary of the Woodlands Young Farmers' Club, which is one of the most active clubs in Southland. This club had a very keen debating team, and Mr. Hargest was a member of the team which won the Southland Championship Cup. He matriculated from the Southland Boys' High School, and has excellent references from the principal, Dr. Uttley. After leaving school he spent a year on his father's farm at Woodlands. In addition to his Young Farmers' Club activities he found time to take a keen interest in other activities in the district. He has just finished his first year at Lincoln College, and the principal comments upon his sound judgment and conscientious work at the college.

The second scholarship is awarded to David Etherington Watts, Otahuti, Southland. Mr. Watts is 19 years of age, and is a son of an Invercargill business man. He is a member of the Thornbury Young Farmers' Club, where he has shown keen interest in the club's affairs, and has taken full part in its activities. He was educated at the Southland Boys' High School, where he was a member of the first XV. He passed the University Entrance examination, and has excellent references from the principal, Dr. Uttley, who testifies to his industry and reliability. During the past year, he has been learning farming, and has excellent references from his employer.

As was only to be expected the war and the general shortage of experienced farm labour have affected the number of applications for the scholarships. Several lads who were recommended and who might have been successful have had to withdraw because their services were required at home. This is unfortunate, but in the circumstances is understandable. Some of those who have not been successful had creditable records, and it is with regret that they have had to be passed over.

North Canterbury Field Day

A. S. NASH, District Secretary, Rangiora.

THE third annual field day of the North Canterbury clubs was once again an outstanding success, and in spite of petrol restrictions this year's gathering was the biggest yet. Good team work by the various secretaries in each district was responsible for the organisation of the carloads, and at 9.30 a.m. on Monday, October 16, a party of more than 130 club members and farmers gathered at Mr. G. R. McDonald's farm at Waikuku.

Mr. H. G. Parish, chairman of the North Canterbury District Committee, welcomed those present, after which Mr. McDonald took the party around his paddocks. While the stock were being arranged for the judging Mr. S. Freeman, organising secretary, gave a talk on recent activities of the federation, explaining the tree-planting scheme and the value of keeping the movement going during the war.

With such a large gathering it was impossible to carry out the judging in one group, and half the party went to the Waikuku twine works, while the other half were engaged with papers and pencils endeavouring to point up the sheep for the cup. There was a change-over after the first section completed their cards, and later Mr. J. Little, a well-known Corriedale breeder, who acted as judge, gave a demonstration on the sheep and pointed out the reasons for his placing of them. Mr. C. Mackenzie, on behalf of those present, thanked Mr. Little for his demonstration and Mr. McDonald for the use of his sheep and yards.

O. G. Evans, Hawarden, scored the most points for the cup.

While at the twine works parties were taken around by Messrs. R. and A. McDonald, who explained the manufacture of binder twine. The afternoon tea was most acceptable.

At 2 p.m. a long line of cars set off for Belfast, where Mr. J. Johns, of Devondale Dairies, took us on a tour of his farm. This farm has long been known as an example of what can be done by the use of irrigation together with manures, lucerne, and good grasses.

Paddocks were seen in all stages, some being ploughed and levelled, others ready to sow, and the rest carrying wonderful swards of ryegrass and clover. At one place on the farm a turbine lifts the water ten feet so that the higher parts of the farm can be watered. Everybody was impressed by the energy and ability of Mr. Johns and the wonderful results he had achieved. At various points Mr. Johns stopped and explained what had been done in the last few years. Mr. K. Dunbar thanked Mr. Johns for the instructive time he had given to everybody.

The next move was to Rangiora High School, where the new model piggeries were inspected. Then followed a break before tea. The District Committee had arranged for all to sit down together in the A. & P. Hall, and as nearly everybody was able to stay, a big family of more than 100 had tea together.

Talkie films were shown in the evening by Mr. Freeman, and Mr. Parish moved a hearty vote of thanks to the organising secretary for supplying the entertainment.

Further Awards in Y.F.C. Essay Competitions

FURTHER awards have now been made in the Y.F.C. Christmas essay competitions. As announced in the December issue, the first prize of five guineas for the best essay on "A Scheme for the Settlement of Young Farmers on their own Properties" was awarded to W. G. Brownlie, Wairoa Club.

This class also included a second prize of three guineas, which has been awarded to Ian D. Colquhoun, Feilding Club, and two prizes each of one guinea, which have been awarded to R. F. Day, Ballance Club, and M. S. Moore.

The essay which gained the second prize is published below.

Second Prize

— By —

IAN D. COLQUHOUN,
Feilding Club.

THERE are many farmers' sons and town boys who would gladly take an agricultural course at a high school and go to work on farms until they were 21 years of age if there was then a prospect of their being able to acquire a farm of their own. Owing to the high cost of land and of equipment, these young men realise that without capital it is almost impossible for them to own a farm for many years. They are thus left with no alternative but to train for city jobs that offer better prospects of advancement.

It is for these young men with limited capital that this scheme is advanced. It depends for its success on two things —firstly, co-operation to reduce costs, and secondly, individual control and competitive effort to give the most incentive. Briefly, it aims to settle four to six young men on one large farm suitably subdivided but worked co-operatively. The advantages as compared with four or six small farms are: (1) A reduction in cost of machinery, buildings, and equipment of as much as 60 per cent.; (2) a saving in living expenses of 40 per cent.; and (3) a convenient and plentiful supply of labour. By increasing carrying capacity the capital value of the land required per sheep would be reduced 50 per cent.

There are many large farms in and around the Manawatu of 600 to 800 acres of easy rolling and ploughable country carrying three to four ewes per acre and obtainable for £30 per acre cash. On these, farmers raising fat lambs usually grow from 30 to 50 acres of rape and swedes, but, as casual labour is not available and costs are high, no hay or ensilage is made, and insufficient topdressing is done. There are also odd farms in the district of 100 to 150 acres of similar land carrying seven to ten sheep per acre by rotational grazing, growing a higher acreage of root crops, and making hay or ensilage as the season permits. The Massey College farm is an example.

Four such farms from the large original block run by four young farmers co-operatively would be the aim of this plan.

The Young Farmers, with about six years' practical experience, should be about 21 years of age, and they may have from several hundreds to a thousand pounds or more of capital. If farmers' sons, they might have the nucleus of a flock. The four or more in each scheme would be chosen so that the assets of each were approximately equal, and for this example it is assumed that each had enough to establish their own flock of about 600 sheep each and put in £500 each towards the capital cost of the 600-acre farm. This would leave £16,000 of the capital cost to be raised and £1000 to cover working expenses for the first year, making £17,000.

It would speak well for the generosity and independence of the farming community if this sum could be raised by farmers through the Farmers' Union or even partly guaranteed and the balance raised as a mortgage on the property. Both would be at the current rate of interest and repayable by a certain amount each year. If this were impossible, the Government could be asked to advance the money. As the running costs of this co-operative farm would be much lower than normally it would be really a very sound investment. If the Young Farmers had more capital the raising of the balance would be less difficult. The scheme would be run by the Young Farmers with one or two experienced farmers acting in an advisory capacity. They could be appointed through the Farmers' Union.

The four Young Farmers would divide the 600-acre block into four equal divisions and manage their own

flocks independently on each. At shearing, dipping, etc., they would combine and handle each flock in turn, using one woolshed, dip, and yards, and so saving on capital outlay on buildings. Subdivisional fencing of each block would be done on each in turn. Topdressing would be done with one set of equipment, giving equal time to each block.

The cultivation of rape, swedes, or other crops, and the making of hay or ensilage would be done by one set of modern implements and the four farmers working together moving round each farm in turn. This would reduce the necessary machinery as compared with four separate farms by 75 per cent., and long hours or two shifts could be worked at busy times, as there need be no hired labour. Wheat or oats could be successfully grown in suitable areas, as the problem of obtaining casual labour would not arise.

Each Young Farmer would receive £2 5s per week and found from the co-operative account, and they would live together in the original homestead, thus making a considerable saving. This plan would be for about five years, longer or shorter according to the amount of capital put in by each Young Farmer, as, until the carrying capacity was at least doubled and the capital debt reduced, it would be impossible for any Young Farmer to marry and build on his own block.

At the end of five years it should be possible to build for each farmer, if desired, and to make each farm separate financially. Each would then take its share of the remaining capital debt, and only the co-operation in the practical working would remain. This could later be reduced if the four farmers considered it desirable.

During the first five years all revenue from the four farms would go into one account, which would be managed by the four Young Farmers and the two elder advisory farmers. This account would receive revenue from the sale of wool, fat lambs, fat ewes, skins, and other produce, and would start with the £1000 allowed for first-year expenses. It would pay each farmer his wages of £2 5s, interest on the borrowed money, a percentage each year to a fund to repay the same, and the upkeep of the one farmhouse where the Young Farmers would live together. It would also pay all working expenses, such as fencing materials, fertilisers, seeds, replacements, and repairs to implements.

Fertilisers, fencing material, etc., not to be used co-operatively would be divided equally between each farm. The account would also pay an equal amount to each farmer for the maintenance and increase of his flock. If it were found that the four farms, owing to variable flock management, contributed different amounts to the general account, 75 per cent. of the difference at the end of each year would be paid to the farmer concerned in excess of his wages. This would reward good flock management.

This scheme has been concerned with the raising of fat lambs only, but the same principles could be applied to other types of farming. The co-operative use of equipment, co-operation to solve labour difficulties, combined with the scope, where possible, for individual initiative and effort are the main points of this scheme, but details could be altered to suit different circumstances.

Y.F.C. Constitution.

Printed copies of the Y.F.C. Constitution are now available in booklet form, for which a charge of 6d. each has been made to cover cost. Orders, accompanied by cash, should be sent to the Organising Secretary, Y.F.C., Department of Agriculture, Wellington.

South Otago Y.F.C. Combined Field Day

A WELCOME improvement in weather conditions favoured the South Otago Young Farmers' Clubs' combined field day, which was held in the Clydevale district on Tuesday, August 1. Members from the various clubs in South Otago assembled near the new Greenfield Consolidated School on Tuesday morning, when Mr. R. McCaw, Waitahuna, the leader of the party, welcomed Mr. E. Bruce Levy, Director of the Plant Research Bureau, and Mr. J. W. Woodcock, Fields Superintendent, Department of Agriculture, Dunedin.

A move was then made to the farm of Mr. N. McKay, Clydevale, where Mr. Levy discussed various problems of the grassland farmer, using a grass and clover strains trial of the Department of Agriculture as a basis for his talk. Mr. Woodcock then used a pasture topdressing trial to exemplify a talk on the uses of various manures. Mr. Shanks, Warepa Club, proposed a vote of thanks to Mr. Levy and Mr. Woodcock for their instructive addresses.

Some of Mr. J. Mosley's Clydesdale horses at the South Otago Y.F.C. district field day.

Mammitis in Cows

Mr. G. McDonald, of the Clutha Veterinary Association, demonstrated a method of treating mammitis in dairy cows. Mr. Keith McCaw, Lawrence Club, proposed a vote of thanks to Mr. McDonald for his demonstration, and to Mr. McKay for the facilities for the demonstration.

The party of seventy were the guests of the Clydevale and Greenfield branches of the W.D.F.U. at lunch. Mr. W. Lockhart, Milton Club, proposed a vote of thanks, and Mrs. A. C. Kee

and Mrs. D. Christie, presidents of the respective branches, replied.

After lunch the farm of Mr. J. Mosley, Clydevale, was visited, and Mr. G. McDonald gave a demonstration on the Clydesdale horse, using as his subject a filly bred by Mr. Mosley. Following this, Mr. F. Mosley demonstrated on the Polled Shorthorn, and Mr. S. Mosley on Romney sheep.

Stock Judging

A start was then made with the judging of the horse section of the inter-club stock judging competition, following which Mrs. Mosley entertained the party to afternoon tea.

Addressing members, Mr. E. F. Pannett, president of the Clydevale Branch of the N.Z.F.U., stressed the necessity for trained farmers to take their place in the rural life of New Zealand. He expressed the good will of the Clydevale Branch of the N.Z.F.U., and said he hoped that the Clutha Valley Club, which had not been functioning for a time, would be reopened in the near future. Mr. Geeves, Lawrence Club, proposed a vote of thanks to Mrs. Mosley and Miss Byers for their hospitality.

Members then resumed the judging of the cattle and sheep sections of the inter-club competition. At the completion of the judging an inter-club tug-o'-war was staged, when a mighty tussle occurred in the final between the Clydevale and Stirling Clubs, resulting in a win for Clydevale.

Before leaving for Balclutha, Mr. A. Pannett, Clydevale, thanked Mr. and Mrs. J. Mosley and Mr. F. and S. Mosley for the opportunity of visiting one of the few farms in Otago that can display such a high standard in sheep, cattle, and horses. Mr. Mosley suitably replied.

Banquet

At Balclutha a banquet was held in the Masonic Hall. Mr. McCaw presided, and the guests of honour were:—Messrs. J. H. Stevenson, Mayor of Balclutha, E. Bruce Levy, A. C. Cameron, J. W. Woodcock, E. Russell, and H. Holgate. At the conclusion, Mr. A. Pannett proposed a hearty vote of thanks to Mrs. A. Bell, president of the Clutha Branch of the W.D.F.U., and the members of the branch, who were responsible for the banquet.

A social and dance followed, and attracted a good attendance. R. Anderson and E. Cross were the M.C.'s.

Parents' and Friends' Evening at Rongotea Club

J. H. GIBBONS, Hon. Secretary, Rongotea Club.

IT has become customary to invite our parents and friends to attend the November meeting of the Rongotea Club. Our "evening" this year was a great success, mainly due to the fact that more club members were present than at any other meeting this year, and also because of the large number of parents and friends who attended. The business of the meeting was conducted in the usual way in order to give our parents an insight into the nature of our work as a club.

After the meeting was closed two items were contributed by the Te Kawau Piano Accordian Band. Practically all the members of this Band are members of our club.

The latter part of the evening was devoted to a debate between members of our club and the Rongotea Farmers' Union. The subject for the debate was, "That the Young Farmer of Today has Better Opportunities of Success than his Grandfather." The Farmers' Union, who took the negative, were represented by Messrs. J. Scott, M. Frecklington, and G. R. McKenzie. The club team comprised J. P. Gloyn, R. Brown, and R. O. Gloyn. The adjudicator, Mr. Fox (Rongotea), gave his decision in favour of the Young Farmers' team.

After the debate another bracket of items was contributed by the accordion band. Supper was then served by the club members, who were willingly assisted by several mothers and sisters, to whom the club is much indebted.

The main feature of the supper was a birthday cake made and iced by the club chairman's sister, Miss Ngaire Dear. The cake was artistically decorated with farm animals, and in one corner was a ploughed paddock with a man and tractor in it.

A word on the financial side of the evening may be of interest to clubs. The rent of the hall was £1 15s, cakes cost £1 5s, hot water 1s, and sandwiches and milk were supplied by club members. The tea and sugar were what remained from our last monthly meeting. The total expenditure was £3 1s, and the sale of tickets in a raffle totalled £3 17s 6d.

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From Tatuanui, Thames, Auckland.
I feel confident that the Course I took will prove to be very useful to me, and am very grateful for the help and assistance given to me during my studies.—Signed (——).

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Wairarapa Y.F.C. District Debate

From left: R. Curran, R. Spooner and E Schofield (Tinui); J. S. Mackay, G. Blatchford and D. McGregor (Masterton); N. Lamont, District Y.F.C. Secretary.
(D. McLachlan, photo.

THE final of the Wairarapa Y.F.C. district debate was recently decided between the Tinui and the Masterton Club teams. The judge, Mr. J. E. Tier, gave the award to Tinui, who took the affirmative.

The subject of the debate was: "That in New Zealand, farming offers the most attractive career for a young man." The teams were as follows:—Tinui: E. Schofield, R. Curran and R. Spooner. Masterton: G. Blatchford, D. McGregor and J. S. Mackay.

At the conclusion of the debate, Mr. G. H. Perry, the district patron, presented the shield to members of the Tinui team, and congratulated them on their success.

The debate attracted an attendance of more than fifty members and friends.

Among the Clubs: Reports on Activities

Western Southland

Thornbury.—Discussions relative to Centennial Tree-planting Scheme and stock judging competitions at Royal Show. Demonstrations on how to judge stock were given as follows:—Dairy cow (W. Young), Romney ram (W. Lindsay), baconer pigs (W. King).

Woodlands.—Presentation made to Mr. M. Clark, a former club chairman, who is to be married shortly. Three instructive addresses were given on stock judging—Southdown sheep (Mr. S. Evans, Longbush), Romney sheep (Mr. G. Smith), and dairy cows (Mr. A. M. Weir, Department of Agriculture, Invercargill).

South Otago

Lawrence.—Discussion on Centennial Tree-planting Scheme. Mr. A. F. Greenall, Department of Agriculture, spoke on the "Elimination of Waste on the Farm."

Stirling.—General business. Talk by Mr. Angus, bank manager, Balclutha, on the "History of Banking."

Central Otago

Roxburgh.—General business. A talk entitled "The Application of Science to Farming," by Mr. G. G. Calder, Department of Agriculture.

North Otago

Hampden.—General business. Arrangements made to hold a club dance.

Tokarahi.—General business. The speaker for the evening was Mr. B. A. Taylor, Government Veterinarian.

South Canterbury

Geraldine.—Arrangements for proposed field day. An address was given by Mr. A. J. Davey, President of the South Canterbury Farmers' Union, his subject being "The Ideals to be Aimed at by Young Farmers of Today."

Milford.—Open meeting at which representatives of Farmers' Union, W.D.F.U., and parents of club members attended. Two debates held. The first was "That New Zealand should Concentrate on Primary Production." The Farmers' Union took the affirmative, and the Y.F.C. the negative. The teams were: Messrs. W. Buchan, C. R. Barnett, and A. Johnson (F.U.), and Messrs. C. Tyall, L. Livesey, and R. Palmer (Y.F.C.). The negative side was declared the winners. The second subject was: "That Farming is More Difficult than it was 50 Years Ago." Affirmative side (Y.F.C.), Messrs. G. Lyall, G. Crossman, and J. Woodhead; negative (Farmers' Union), Messrs. A. E. Dobson, G. A. Davey, and A. Botting. The judge, Mr. G. Mulligan, gave his decision in favour of the Y.F.C. team. Supper was supplied by members of the W.D.F.U.

Waihaorunga.—Debates held with Waihaorunga Women's Institute. The subjects under discussion were, "That the Women's Institute has Proved Beneficial" and "That Men Should do the Housework on Sunday." The institute teams won both debates, the first by 151 to 147 points, and the second by 143 to 141 points. Mr. McHardie, Waimate, was judge. A field day was held on November 14, there being an attendance of 40, 12 of whom were members of the general public. Demonstrations and lectures were given as follows:—Grasses and clovers on experimental plots on Mr. M. Armstrong's property, and top-dressing (Mr. C. C. Leitch, Department of Agriculture), and irrigation project in building lime-crusher (Mr. S. Hurst).

Mid-Canterbury

Hinds.—General business. R. D. Robinson gave an interesting account of his trip to Australia.

Methven.—Discussion on Centennial Tree-planting Scheme and national stock judging at Royal Show. Mr. M. B. Milson gave an instructive talk on herd testing and its advantages to the farm.

Christchurch

Ellesmere.—Decided to plant trees in A. and P. showgrounds as a Centennial Memorial. D. Hurford and M. Brooks (club members) received the congratulations of the meeting on their success in the stock-judging competitions at the Christchurch Show. Interesting sound films were shown by the manager of Massey, Harris, and Co., illustrating the latest developments of machinery on the farm. A number of films of a travel and educational nature were also exhibited.

North Canterbury

Oxford.—Propose to hold a Christmas dance. The club secretary, W. I. Cray, gave a brief talk on the recent field day held by the North Canterbury clubs.

Nelson

Dovedale.—General business. Talks on "Pasteurisation" and "Poultry Farming" were given by club members, T. Cowin and W. Gardiner, respectively.

Moutere.—Discussions on Centennial Tree-planting Scheme and Y.F.C. Centennial Camp at Wellington. A general discussion took place relative to points of interest at recent Nelson A. and P. Show.

Wairarapa

Carterton.—Mr. R. Wilson, Department of Agriculture, gave a lecture on "The Installation and Maintenance of Dairy Equipment."

Martinborough.—General business. Mr. N. Lamont, Department of Agriculture, exhibited sound films at the meeting.

Masterton.—Five-minute talks were given as follows:—"Foot-rot in Sheep" (G. Blatchford); "Foot-rot in Sheep" (J. S. Mackay); "Dipping Sheep" (D. McLauchlan); "Why I Joined the Y.F.C." (K. Donovan); "Ploughing a Paddock" (W. Cooper); "Humour and Farming" (D. McGregor).

Manawatu

Apiti.—Nominations accepted for national stock-judging at Royal Show. An address was given by Mr. H. de O. Chamberlain, Department of Agriculture, on "Diseases and Pests in Crops."

Feilding.—Arrangements made to hold a club dinner as a conclusion to the year's activities. A talk entitled "General and Fodder Crops" was given by Mr. H. Brewster, the club advisory president.

Fitzherbert.—General business. Discussion on a scheme of labour substitution to enable members to visit the Centennial Exhibition.

Halcombe.—National stock-judging competitions and Centennial Camp under discussion. Short talks were given by members on "The Bren and Hotchkiss Guns" (J. Curtis), and "Aeroplanes and How to Fly Them" (E. W. Barnett).

Kairanga.—Arrangements for shearing competition at A. and P. Show. Mr. A. McKegg gave a motion picture display of his recent trip through U.S.A.

Kimbolton-Kiwitea.—An interesting lecture entitled "Pasture Utilisation on Hill Country and Flats" was delivered by Mr. C. J. Hamblyn, Department of Agriculture.

Levin.—General business. A lecture was given by Mr. H. de O. Chamberlain, Department of Agriculture, on "Crop Pests."

Rongotea.—General business. Mr. Bruce McLeod, Colyton, gave an address on "Trees and Tree-planting."

Shannon.—Business meeting.

Whakarongo.—Field day held on Mr. J. Spall's property at Te Matai. There was an attendance of 15 club members and 10 visitors. B. Dickson, club chairman, made the opening speech, which was followed by demonstrations and lectures—"Dairy Cows" (T. Ranford), "Horses" (J. McCool), and "Pastures" (L. Earl).

Wanganui

Bulls.—An address on the method of judging Romney sheep was given by Mr. W. K. Morton.

North Taranaki

Cardiff.—Teams selected to represent the club in the Y.F.C. stock-judging competitions at the Stratford Show. Mr. G. Palmer displayed his films of the Y.F.C. tour of New South Wales.

Hillsborough-Tarurutangi. — A lecture on butter-making was given by Mr. S. Arbuckle, factory manager. At a previously unreported meeting, an inter-club debate was held, the subject being "Primary Industries v. Secondary Industries." The Hillsborough Club (R. Andersen, N. Sampson, S. Styles, and R. Meharry) were the winners by a very small margin from the Karawaka Club, which was represented by K. Lattimer, N. Tate, J. Munro, and D. Schrider.

Inglewood.—General business, followed by short speeches from several of the members present.

Midhurst.—Teams selected for judging competitions at A. and P. Show. Club raffle drawn. Discussion on how to judge a dairy cow and baconer pig. Field day held on Mr. Crosby's property at Waipuku. There was an attendance of 22. Mr. Crosby demonstrated the points of a Jersey cow and compared same with two other cows

Mangamohoe.—Discussion on Centennial Tree-planting Scheme.

Mangorei.—General discussion took place on farming matters.

Omata.—Club debate held. The subject was "That Grassland Farming is More Advantageous than Cropping." Hurford team (affirmative), M. Rea, J. Rea, and J. Schrider, were defeated by the Koru side (negative), by ½ point. The latter team was represented by B. Bentham, N. Maskelyne, and T. Schrider.

Rahotu.—Three new members elected. An interesting talk entitled "The Value of Shelter on the Farm" was given by Mr. G. E. C. Prosser.

Toko.—Teams selected to represent the club in the competitions at the Stratford A. and P. Show. Mr. J. M. Hopkins, Department of Agriculture, presented certificates and cups won by members of the club and the Farmers' Union. He also gave a short address.

Urenui.—Arrangements finalised for a tennis match with the Okau-Tongaporutu Club. General discussion took place on various farming topics.

Southern Hawke's Bay

Woodville.—Donation of £1 made to Southern Hawke's Bay District Committee. Mr. T. Richardson, of Messrs. Hodder and Tolley, Ltd., gave two talks, the subjects being "Pasture Grasses" and "Travel."

Central Hawke's Bay

Takapau.—The Centennial Tree-planting Scheme was discussed in detail. Mr. J. W. Palmer, Department of Agriculture, exhibited several films of agricultural interest.

Northern Hawke's Bay

Matapiro.—Arrangements for proposed field day. The club chairman, D. H. Beamish, spoke on "Sheep Breeding." Mr. A. W. Whyte, advisory president, gave a demonstration of how to make a rope halter. Talks were given by club members as follows:—"Degree of Honesty to be aimed at by a Breeder in showing his Animals at Fairs" (E. H. Beamish), and "Useful Farm Gadgets" (A. W. Butt). The latter talk was well illustrated by the speaker with the aid of blackboard diagrams.

Poverty Bay

Matawai.—Business meeting.

Te Karaka.—Arrangements for district field day. Mr. W. C. Bull, advisory president, spoke on a recent tour of the Waikato. At a previous meeting talks were given by members as follows:—"Army Remounts" (L. Magnussen), "Limbs" (W. Peveral), "Fertilising" (M. Campbell), "Willowing" (J. Bayley), "Docking Lambs" (N. Duncan), "Common Sense" (A. Manuel), "Pumpkins" (A. Bayley), and "Top-dressing" (J. Dymock).

Te Kuiti

Te Anga Central.—Film display was provided by Mr. H. Woodyear-Smith. The two films exhibited showed the methods used in America for clearing land and making hay, and a scenic trip through part of Australia and the South Island of New Zealand.

Eastern Bay of Plenty

Edgecumbe.—Business meeting.

Taneatua.—A lecture was given by Mr. D. Burgoyn-Thomas on "Control of Mammitis."

Waimana.—General business. At a previous meeting Mr. Wilson spoke on "Modern Banking."

Western Bay of Plenty

Waihi.—Discussion on stock-judging at Waihi A. and P. Show. A lecture was given by Mr. A. V. Allo, Department of Agriculture, entitled "The Certification of Ryegrass and of Potatoes."

Rotorua

Rotorua-Ngongataha.—A lecture was given on the "Manufacture of Superphosphate."

Waikato

Huntly West.—Business meeting.

Hauraki.—A lecture was given by Mr. J. Mullins, M.R.C.V.S., on "Diseases of Cattle." At a previous meeting a club debate, "That Home Separation is preferable to Cheese," resulted in a win for the affirmative, led by L. G. Court, over the negative, led by J. C. Epps. Three field days were held recently. The first was on Mr. A. Bailey's property at Wharepoa, there being an attendance of 53, of whom 42 were members of the general public. Mr. A. Weir, Matangi, demonstrated the points to look for in a good Ayrshire beast. The second day was held at the Matatoki (Selwyn Hall's) Stud. There were over 46 spectators present, and Mr. H. Woodyear-Smith gave an address on "Soil Fertility." The third field day was held at Mrs. Irvine's stud farm, there being an attendance of 34. Mr. A. V. Allo, Department of Agriculture, lectured on "Grassland Farming."

Tahuna.—Several motion picture films were exhibited by Mr. H. Woodyear-Smith, and he concluded the evening by giving an address on "Land Erosion."

Auckland

Auckland.—General business. Field day held at the works of W. and R. Fletcher, Ltd. There was an attendance of over 300, of whom 250 were members of the general public and 20 were visiting club members. The opening speeches were made by the Hon. W. Lee Martin, Minister of Agriculture, and Mr. M. J. Scott, Supervisor of the Pig Industry, Department of Agriculture.

Warkworth

Kaukapakapa.—Talk entitled "Australia from the Farmers' Viewpoint" was given by Mr. H. Woodyear-Smith. At a previous meeting talks were given by club members as follows:—"Pig Breeding" (C. Draper) and "Farm Forestry" (J. Barr). Field day held at Waitake. There were 55 in attendance, 30 of whom were members of the general public. Demonstrations and lectures were given as follows:—"Farm Tractors and Machinery" (Mr. Kelly), "Design and Management of Dairy Sheds" (Mr. Malone), and "Pasture Plants and Pasture Management" (Mr. P. S. Syme, Department of Agriculture).

Port Albert.—Business meeting.

Whangarei

Kerikeri.—Discussions on whether to hold a club dance to raise funds. Notes on Australian citriculture were read.

Dargaville

Tangiteroria.—Debate "That Town Life is preferable to Country Life." General business.

Dargaville.—Mr. E. H. Arnold, Department of Agriculture, spoke on the "Better Feeding of Livestock." This was illustrated with lantern slides.

Kaitaia

Kaitaia.—A debate entitled "That Tractors are more useful than Horses for Farm Use" was won by the negative side (G. Bell, leader, L. Parker, K. Foster, and A. Bell). The team taking the affirmative was represented by T. Matthews, leader, V. Flinn, H. Hooper, and A. Jameson. The judges were Mr. Hanlon and Mr. Thompson.

Health Notes for the Farm

Contributed by the Department of Health

Hints for the Holidays

Give me the life I love,
Let the lave go by me;
Give the jolly heaven above
And the byway nigh me,
Give the face of the earth around,
And the road before me,
There's the life for a man like me,
There's the life for ever.
—Robert Louis Stevenson.

THE best antidote for mental and physical dullness, provided this does not arise out of definite illness, is to be found in a vacation that will offer a change of environment and make it possible to get away for a time from the accustomed work.

Rest, recuperation, and the storing-up of energy is the purpose of a holiday. To many, the out-of-doors naturally proves a great attraction. It is well for those planning such a holiday to remember that there are various precautions which are well to keep in mind, and that some forethought is necessary to secure the maximum of health and happiness from the long-looked-for vacation.

Sunshine, for instance, is beneficial and is a health-producer. However, the coat of tan so coveted by some holiday-makers cannot safely be acquired in a few days. Prolonged exposure to sunlight may only result in painful burns or blisters of the skin, which may cause serious ill health. However, this will be dealt with more fully in our next article in the "Journal."

First-aid

Then there is no more healthful exercise than rowing or swimming, but the holiday period has its annual toll of those who "rock the boat" and those who misjudge currents or depth of the water. Numerous drowning accidents occur because of chances taken in unknown waters. It should be a general rule never to swim alone or to overtax one's ability as a swimmer. The closest supervision should be exercised over children at the seashore or in boats.

It is not difficult today to obtain information concerning first-aid, and everyone should learn how to apply artificial respiration in case there is need to restore breathing to a companion or someone else who is apparently drowned. Artificial respiration has served to revive many persons who would otherwise have drowned.

The Schafer method is based on sound physiological principles, and is explained and illustrated in the accompanying instructions on restoring animation to the apparently drowned.

Frequently there occur during camping trips various minor injuries which, if properly taken care of by first-aid methods, will not result in serious infections. One should therefore learn the fundamentals of first-aid. First-aid kits are easily obtained and are so convenient for emergencies that they should be part of one's holiday equipment.

Drinking Water

One of the prime necessities of healthy holiday camping is a safe supply of drinking water. As a general rule, it is safer to boil water unless it is from an assured source, as is fortunately done in the popular pastime of tea-making.

Milk, like water, if not pasteurised and protected from possible contamination, offers an ideal method of transmitting disease. Pasteurisation destroys disease-producing germs. If pasteurised milk cannot be obtained it is safer to boil the raw milk before use. The

Swat That Fly NOW

Consider now the little fly!
Come, listen, and I'll tell you why.
He has his birth in the manure,
Crawls forth and loiters in the sewer;
And, smeared with deadly germs,
He leaves his brother maggot-worms,
Unfurls his dainty wings of silk
And dumps his microbes in the milk:
Where their huge numbers mount and mount,
Increasing the bacterial count,
Until they reach the food supply
Some mother gives her "baby-bye."
The fly comes gaily unto us,
His feet all gummed with poison pus;
And, singing clear his song so sweet,
Alights and cleans them on the meat.
He is not proud and oft will stoop
To wash his tootsies in the soup.
Oh! do not call him indolent!
He calls that summer-day mis-spent
In which he's failed to load the breeze
With the live germs of some disease;
And if he finds them not, though hurt,
He'll be content with just plain dirt.
The early fly's the one to swat;
It comes before the weather's hot,
And sits around and files its legs
And lays at least ten million eggs,
And every egg will bring a fly to
Drive us crazy by-and-bye.
Oh, every fly that skips our swatters
Will have five million sons and daughters,
And countless first and second cousins,
Nephews and nieces, scores of dozens;
And thus it goes, an endless chain,
And all our swatting is in vain
Unless we do that swatting soon,
In Springtime and in early December,
Lo, men and women, let us rise,
Roll up your sleeves, and swat the flies!
—Anon.

milk should always be carried separately and kept cool.

Foods

There are certain foods for the hot weather often experienced during a holiday which have a filling and satisfactory effect. These include the coarse vegetables, such as lettuce, celery, cabbage, brussels sprouts, and the like. Tomatoes, oranges, apples, and lemons are excellent hot-weather foods. Other foods may, of course, be included in the diet. Simple and easily digested foods with liberal proportions of fresh green vegetables and fruits should form the basis of summer holiday diet.

Milk, either as a drink or included in foods, is of value the year round. During hot weather much more fluid is needed because of the water necessary for evaporation from the skin. Consequently, water consumption should be adequate.

If cooking is done by out-door holiday-makers, fires should be extinguished before leaving. By failing to do so lives may be endangered and valuable timber and scenic attractions destroyed.

Clothing

The first essentials of comfortable hot-weather clothing are that it is small in amount and that it hangs loosely about the body, being mainly supported from the shoulders. Constricting clothing which impedes the circulation should be avoided. In warm weather we see the obvious advantages of openings at the neck and wrist that are so characteristic of women's attire, and the obvious disadvantages to the man of his usual cumbersome and almost hermetically sealed clothing. That many men can endure, apparently with equanimity, clothing that is far too thick for hot weather is a tribute to their patience and endurance and not to their common sense.

Though our imagination on hot holidays may revert to the joys of a life untramelled only by scanty clothing, comparative comfort can be obtained by loosely-falling, lightweight, loosely-woven clothes, with a light hat which allows a free circulation of air. When packing, remember that though we hope for summer at Christmas, we sometimes meet winter, and warm clothing cannot be left out of the bag.

In conclusion, remember that a vacation for health is successful only when it has made it possible for one to come back better fitted physically and mentally to face life.

HURRY UP!

DON'T WASTE TIME!!

Immediately after removal from the water, try to clear fluid from the patient's lungs by turning him face and head downwards, so that it may run out of his mouth or nose.

Open mouth and clear it of any weeds or foreign matter. Draw the tongue forward.

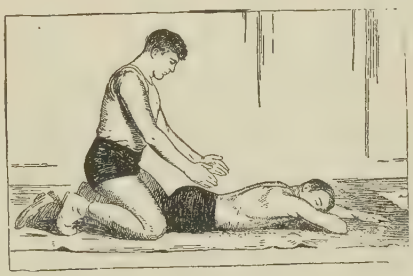
Loosen or remove all clothing round his chest, waist, and throat, but no time should be lost in doing so.

If he begin to breathe, take off the wet clothing and wrap him in any dry clothing or blankets. Rub briskly and move the limbs to promote circulation of the blood.

Keep patient warm and quiet for some hours to avoid collapse.

TO ARTIFICIALLY RESTORE BREATHING

If breathing does not quickly commence, do as here shown, and send for a doctor.



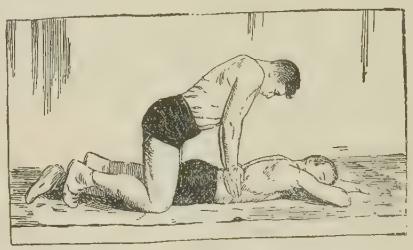
Position for the operator before exerting pressure.

TURN PATIENT ON HIS FRONT, with the arms laid forward.

TURN HIS FACE TO ONE SIDE.

KNEEL ASTRIDE or to one side, facing his head.

PLACE YOUR HANDS ON THE SMALL OF HIS BACK, one on each side, with the thumbs parallel and nearly touching.



Correct method of applying pressure in artificial respiration.

BEND FORWARD, to bring your weight to bear on your wrists; make steady, firm, downward pressure thus, while you count—slowly—one, two.

BEND BACKWARDS to ease the pressure, while you count—slowly—one, two.

CONTINUE THIS PRESSING AND EASING, counting one, two, for each movement, until patient begins to breathe. The movements should be repeated about twelve times to a minute.

MEANWHILE send assistant to nearest house for blankets or hot bottles to apply to limbs and over region of heart, or get assistant to remove patient's clothing, rub limbs, and do whatever else is advised herein.

DO NOT GIVE UP THIS METHOD OF PERFORMING ARTIFICIAL BREATHING UNTIL A DOCTOR ARRIVES, OR FOR AN HOUR OR EVEN MORE!

Will the reader be good enough to try to remember what he or she learns here.

READ! LEARN!! REMEMBER!!!

YOU MAY THEREBY SAVE A HUMAN LIFE ON SOME OCCASION.

The Farm Home and Kitchen

Contributed by the Association for Country Education

Useful Hints for Removing Stains From Your Clothes

THERE are many ways of staining one's clothes in the summer. Walk through long grass after the cars have passed over it and the grease from the underside of the cars plentifully marks one's stockings; slip on the grass and there's a green stain; eat a juicy peach and the drips leave a stain —and so it goes on.

To take the grease out of stockings, etc., first apply a solvent, such as carbon-tetra-chloride, or any proprietary dry cleaner. Do this in the usual way for removing grease, that is, put a dry pad of cloth on the grease and draw a circle of solvent around the mark on the wrong side and then work it inwards. When nearly all the grease has passed on to the pad, wash the stockings, etc., in warm suds in the usual way.

If the garment cannot be washed just repeat the application of solvent, using a dry part of the pad, thus rinsing all the greasy solvent out. Light-coloured, wash-leather gloves stained with car grease can easily be washed spotless if the grease is first softened with solvent.

Tar

Tar will also dissolve in carbon-tetra-chloride or in turpentine. If possible, dip the tarry part right into the solvent in a small bowl and rub the tar out. Afterwards, wash in warm suds to remove the remaining mark. Otherwise treat as described above.

Tar stains on a carpet should be scrubbed with a cloth soaked in the solvent and the treatment repeated until no more dark colour comes off on the cloth.

For washable materials, if the tar stain is old and dry, rub some lard or butter into the stain and wash it in soap and water several times.

Grass Stains

Grass stains can usually be removed by washing in hot water and soap as in ordinary washing, but if the material is woollen and must receive more gentle treatment, a mild bleach, such as Condy's crystals, followed by peroxide, can be used to remove the stain. The solution to use should be made of ½ teaspoonful of the crystals in 1 cup of water.

Dampen the woollen garment and stretch the stained part over the mouth of a basin containing luke-warm water. Apply the pinkish liquid to the stain with a medicine dropper or a clean cork and allow it to remain for about five minutes. Then remove the pink or brown stain with hydrogen peroxide applied in the same way. Rinse at once by dipping into the basin. If the grass stain has not completely faded, the treatment can be repeated.

Be sure to wash the garment well in warm suds afterwards. If there is no peroxide available, lemon juice may be used instead. **Be sure to rinse well** after using these or any bleaching agents.

Fruit Stains

Fruit stains will wash out readily (while still fresh) in clear hot or warm water (**no soap**). If they are once allowed to set either through drying-in or washing with soap, the Condy's crystals and peroxide treatment will usually remove them.

Sometimes acid fruit juices fall on coloured materials and bleach out the colour. To restore it, an alkali must be applied. Before using the alkali, if possible test its effects on a small piece of material to see whether it will affect the colour. If it is found that the dye is not affected by ammonia, the simplest treatment is to hold the stain over a bottle of strong ammonia so that the fumes can penetrate the material.

Another simple treatment is to moisten the stain and sprinkle ordinary baking soda on it (both sides). When effervescence ceases, sponge or rinse the spot with clear, warm water.

Chewing Gum Stains

Chewing gum stains left after the gum has been scraped off may be removed either by softening the stain with egg-white and washing in the usual way or by sponging alternately with carbon-tetra-chloride and clean warm water.

Dye Stains

Dye stains from wet bathing suits, etc., are difficult to remove, as they differ in chemical composition. Some will bleach out if repeatedly alternately soaked in water for 10 to 12 hours and put out in the sun.

A safe bleach for white silk and wool is dilute peroxide made slightly alkaline with a few drops of ammonia. Soak the stain in this solution until it disappears and then rinse very thoroughly.

Resins from pine trees, etc., can be removed by sponging with turpentine,

carbon-tetra-chloride, or methylated spirits.

Perspiration Stains

Perspiration stains can usually be removed by sponging with fresh water to which a few drops of ammonia have been added, or by the use of baking soda as described for removing acid fruit stains. After rinsing well, put the garment in the fresh air. If the material is white and there is a yellowish stain, bleach it out with either Condy's crystals and peroxide or peroxide alone (with a few drops of ammonia added).

Mildew Stains

Mildew stains which will not respond to bleaching with soap and water and sunlight, nor to lemon juice and sunlight, can be bleached with the Condy's crystals method. However, if the material has been badly eaten into by the mildew nothing can prevent its rotting, no matter how mild the bleaching treatment used.

Very bad stains from fruit, vegetable, or tea may be removed from white cotton and linen by the use of Javelle water. This is a very strong bleach and is not recommended for general household purposes, but should anyone require it to bleach a white tablecloth, bedspread, etc., which has been badly stained, application may be made to A.C.E. Headquarters, for the directions for making and using it.

Are Our Adolescents Ready For a Job?

HOW many girls who feel well equipped to do a good job after leaving school next month will miss securing a position because of a poor complexion, poor posture, unsightly teeth, or a malnourished appearance? How many who are overweight will be in disfavour because the interviewer feels that they will not be alert and keen in carrying out their work.

A good complexion, good teeth, good posture, and desirable weight are not only assets, but are essential to a girl or boy seeking work. The employer himself quickly appraises an applicant on all these points. A manager who has been employing girls for 15 years says: "I seldom hire a girl with a poor complexion. If she lets herself slump down in her seat while waiting to be interviewed, little notice will be taken of her; she should sit erect and look as if she were 'on her toes.' Teeth are so important that girls themselves realise this, and frequently say that they will have dental work attended to as soon as they get a job."

Improving Appearance

Few girls and boys—or even mothers—appreciate the importance of food in improving appearance, protecting teeth, or controlling weight. Many girls are so afraid of becoming fat that they are sadly malnourished. On the other hand, some girls who eat sweets in abundance gain weight far in excess of a safety or beauty zone. They are more likely to have a breakfast of sweet buns and sweetened tea; for lunch, a meat pie, and more tea, with pie or cake for dessert; and in-between meals of bakery cakes, sweets, and ices.

Such meals are deficient in foods necessary for the growth of "teen ages," for health protection, and for an appearance of vigorous health. A bad skin condition and constipation may result, while stooping shoulders, rough, unkempt hair, and a heavy, dull, listless expression are sure to follow.

For good health, which is evidenced by an alert manner, good posture, a clear skin and hair that is smooth and glossy, every boy and every girl must have milk, vegetables, and fruit—not just a few days before an interview, but for months before; from early childhood is best. If sweets are eaten, they should be used as dessert at the end of a meal, and then preferably in the form of a simple pudding, custard, or fruit.

Dental work is not only expensive, but indicates something fundamentally wrong with the diet and health. What a pity boys and girls do not realise that proper food is necessary for good teeth.

Early Habits

A wise mother will help to establish such food habits early in childhood, and will continue to encourage the adolescents to drink milk and eat plenty of fruit and vegetables and whole-grain bread and cereals. Such good food habits, together with plenty of fresh air, sunshine, and exercise, and long hours of sleep, will give boys and girls that look of absolute cleanliness, freshness, and good health that must supplement his or her special training for a job.

BEAN AND NUT CHOWDER.

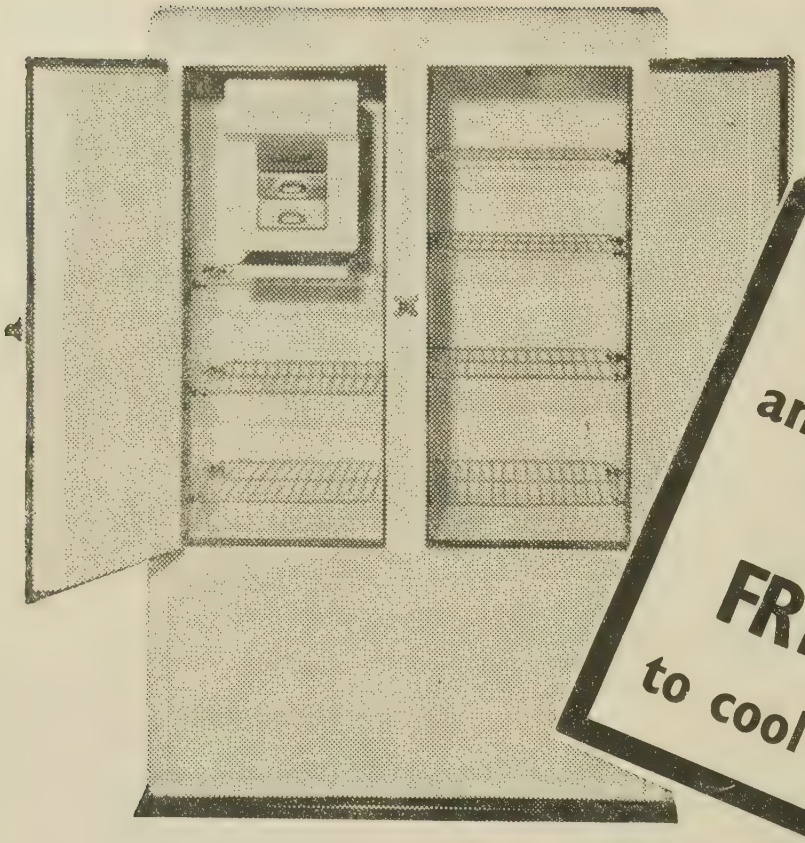
Dried lima beans, 2 cups. Sliced onions, 1 cup. Diced carrots, ½ cup. Minced parsley, 1 tablespoonful. Sliced raw potatoes, 2 cups. Peanut butter, 1 cup. Scalded milk, 1 quart.

Method: Soak lima beans overnight and drain. Put into a saucepan with plenty of cold water and boil gently for one hour. Pour the water into another saucepan and arrange the vegetables on the beans in successive layers, sprinkling each layer lightly with salt and pepper. Return the liquid adding boiling water if necessary. Cook until the vegetables are soft. Mix the peanut butter to a thin, smooth paste with a little of the hot milk and add to the chowder with the remaining milk. Blend thoroughly and serve with a garnish of chopped parsley.

FISH CHOWDER.

White fish, 1lb. Cold water, 3 cups. Salt pork or bacon, 2 slices. Onion (small), 1. Diced carrots, 1½ cups. Milk, 2 cups. Salt, 2 teaspoonfuls. Potatoes (medium), 4.

Method: Wash the fish and cut in pieces off the bones. Cook the bones in cold water 20 minutes and strain off the liquid. Cut the bacon (or salt pork) into small pieces and fry with the sliced onion; then add the hot liquid and vegetables and cook 20 minutes. Add the fish and cook 15 minutes longer at a moderate temperature. Then add the milk and simmer five minutes. Serve with crackers.



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Recommended Recipes

Here are some recipes for "cut and come again" cakes and breads suitable for picnickers, harvesters, etc. (Cakes marked with *, having no moisture other than eggs and butter, can be packed to send to soldiers.)

*WHEATMEAL FRUIT CAKE.

½ lb. butter.
Peel and nuts to taste.
12 oz. wheatmeal.
1 lb. mixed fruit.
4 eggs well beaten.
10 oz. sugar.
¼ teaspoon cream of tartar.
¼ teaspoon of baking powder.
(No soda.)

Method.—Beat butter and sugar. Add eggs. Add fruit and essences. Lastly wheatmeal and cream of tartar and baking powder. Bake 1½ hours steadily at 325-350 deg. F.

ECONOMICAL FRUIT CAKE.

1 lb. flour.
½ lb. butter.
½ lb. sugar.
1½ lb. fruit.
¼ lb. peel.
¾ cup milk.
3 eggs.
1 tablespoon syrup.
1 teaspoon soda.
Almonds.

Method.—Add soda and syrup to milk and heat slightly until dissolved. Rub butter into sifted flour (as scones). Add sugar and fruit, pour in milk, etc., and lastly add beaten eggs. Put in tin lined with greased paper and bake 2½ to three hours at 325 deg., dropping to 250 deg.

WHOLEMEAL PRUNE BREAD.

1 cup flour.
2½ cups whole wheat flour.
1 teaspoon salt.
4 teaspoons baking powder.
½ cup sugar.
1 egg.
1 tablespoon melted butter.
1¾ cups milk.
1 cup uncooked prunes.

Method.—Mix dry ingredients. Add prunes which have been pitted and cut in small pieces. Add milk and slightly beaten egg. Beat well. Add melted butter. Turn into a well-buttered bread pan. Bake in a slow oven 325 deg. F. about one hour.

*NUT SHORT CAKE.

1 lb. flour.
½ lb. butter.
½ lb. light brown sugar.
2 teaspoons spice.
2 teaspoons cinnamon.
2 teaspoons cream of tartar.
2 teaspoons soda.
2 eggs.

Method.—Work with hand to stiff paste and cut in half. Roll half and place on tray. Cover with jam and cover with second half. Brush with milk and cover with chopped nuts. Bake 20-30 minutes at 350 deg. F. Cut in fingers.

CHOCOLATE CAKE WITH RAISINS.

2 tablespoons cocoa.
4 oz. butter
¾ cup walnuts.
1 cup milk
1 teaspoon soda.
2 eggs.
8 oz. sugar.
1 cup seedless raisins.
8 oz. flour.
½ teaspoon cream of tartar.
2 teaspoons vanilla.
Pinch salt.

Method.—Cream butter and sugar and add the beaten eggs. Fold in sifted flour, cream of tartar and salt, and add soda and milk and, lastly, fruit. Bake in sandwich tins at 400 deg. (top off, bottom low) for 30 minutes. When cold, join together with chocolate filling and ice top.

N.B.—Instead of sandwich tins, one large tin may be used. Bake one hour.

COCONUT LOAF.

2 cups flour.
¾ cup coconut.
½ cup sugar (less if not required so sweet).
2 teaspoons baking powder.
1 dessertspoon melted butter.
1 egg.
Pinch salt.
Enough milk to make right consistency (about ½ cup).

Bake in slow oven ¾ hour.

BOTTLED ASPARAGUS.

Prepare the asparagus, tie in uniform bundles, and boil for four minutes. Pack while hot in hot jars. Cover with boiling water and add to each pint jar one teaspoonful salt and one tablespoonful vinegar. Adjust rubber and lid, and screw tightly. Boil in hot water bath for 1½-2 hours. Screw lid down tightly.

BAKED APPLES IN VARIETY.

Method.—To make more attractive and give variety, apples may be stuffed before baking. Each apple is cored and filled with: (1) Raisins, dates, or any other dried fruit, or (2) apricot —any other tart jam, or (3) light-brown sugar and ½ teaspoon cinnamon or cloves. Place ¼ to ½ teaspoon butter on each.

APPLE PORCUPINE.

Sugar, 1½ cups.
Water, 2½ cups.
Butter, 1 tablespoon.
Cinnamon, ½ teaspoon.
Medium sized apples.
Blanched almonds.
Cream (or custard).

Method.—Cook sugar and water for three minutes. Pare and core apples and cook them in the syrup until tender but not broken, turning them frequently. Drain and place the apples in a baking-dish. To the syrup add the butter and the cinnamon and continue to cook until quite thick. Fill cores of apples and surrounding spaces with syrup and stick apples into the blanched almonds cut lengthwise. Place in oven at 450deg. F. and brown the tips of the nuts. Cool and serve with cream or custard.

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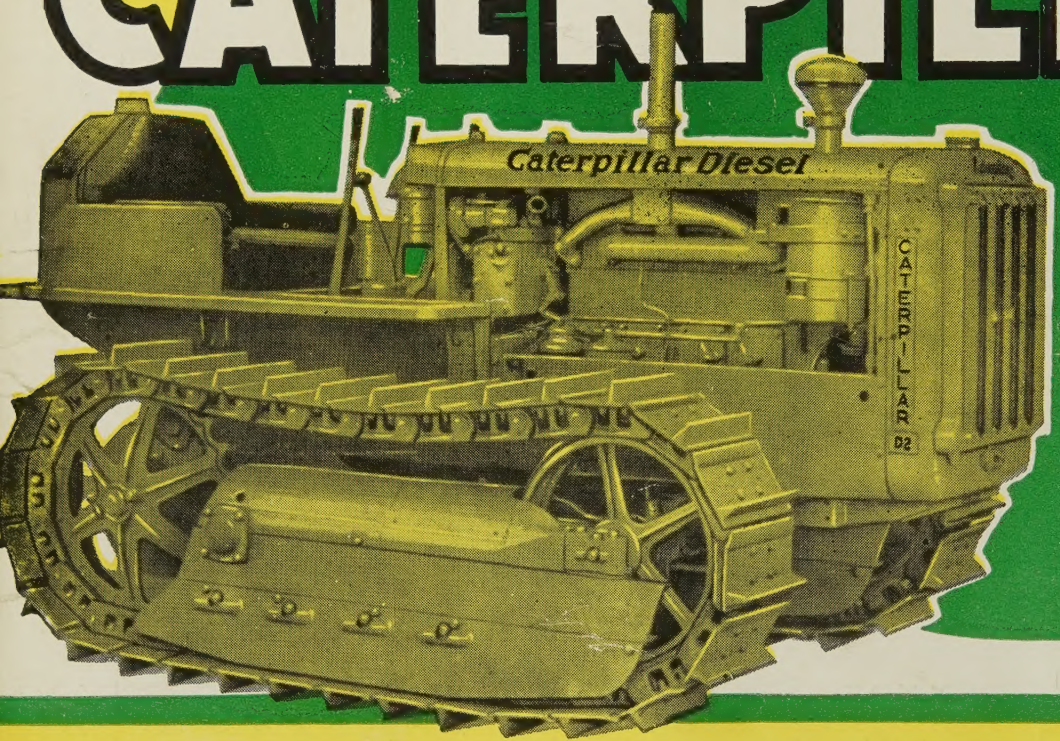

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